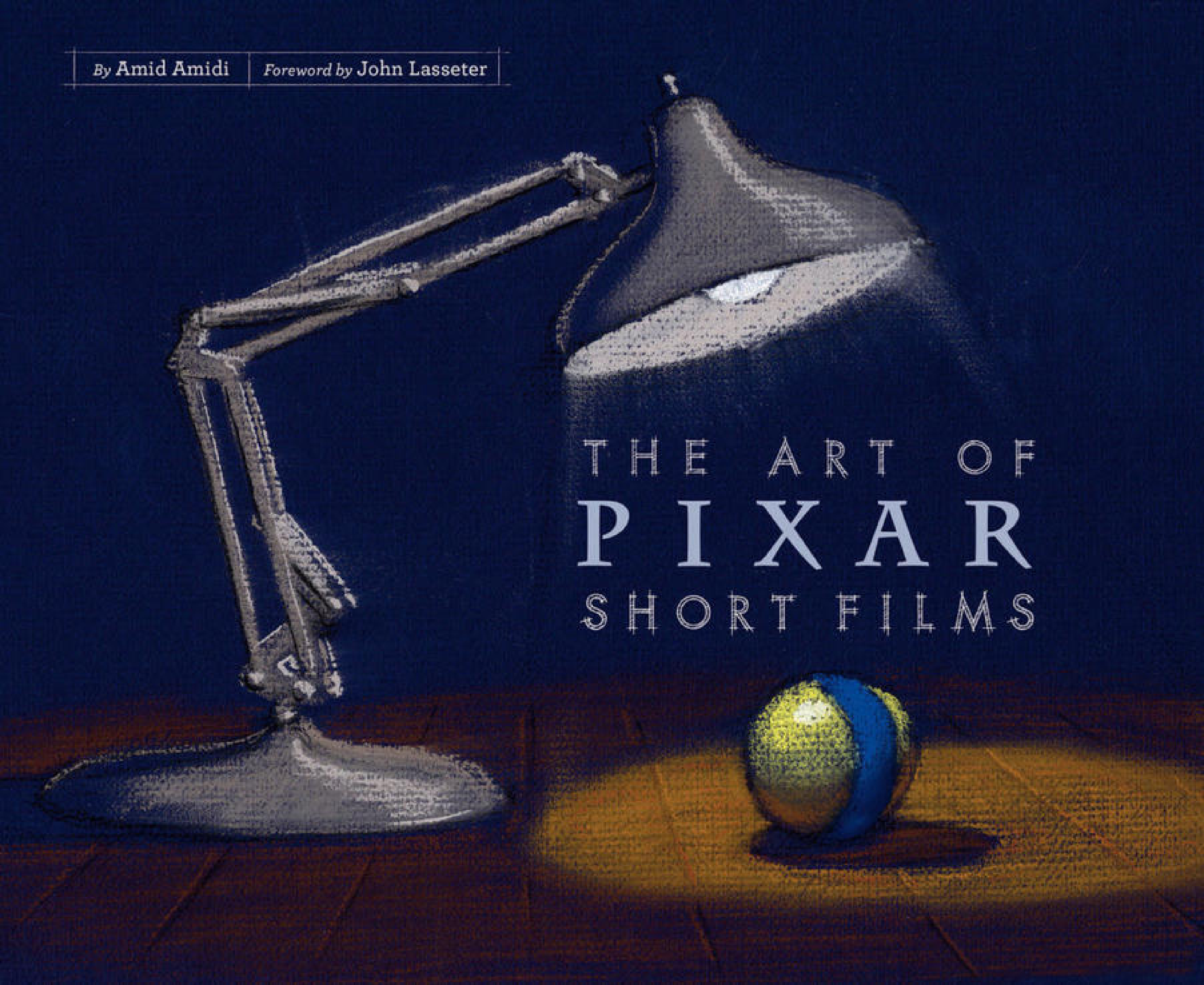
By Amid Amidi | *Foreword by* John Lasseter



THE ART OF PIXAR
SHORT FILMS

John Lasseter 1984

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SHORT FILMS

By Amid Amidi | *Foreword by* John Lasseter

Research Associate Adam Abraham

CHRONICLE BOOKS

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Library of Congress Cataloging-in-Publication Data

Amidi, Amid.
The art of Pixar short films / by Amid Amidi ;
foreword by John Lasseter.
ISBN 978-0-8118-6606-4 (hc)
ISBN 978-1-4521-6521-9 (epub, mobi)

Designed by Public

Chronicle Books LLC
680 Second Street
San Francisco, California 94107
www.chroniclebooks.com

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CRIPTION: P·I·X·A·R DISSOLVES
VER LOGO.

MENTS DATE: 5-8-87

NOTES:
DX 36
HOLD 36
FO 24

SEQUENCE/SHOT:
OT-2

Sheet:

FRAME COUNT:
96f

PAGE#:
06

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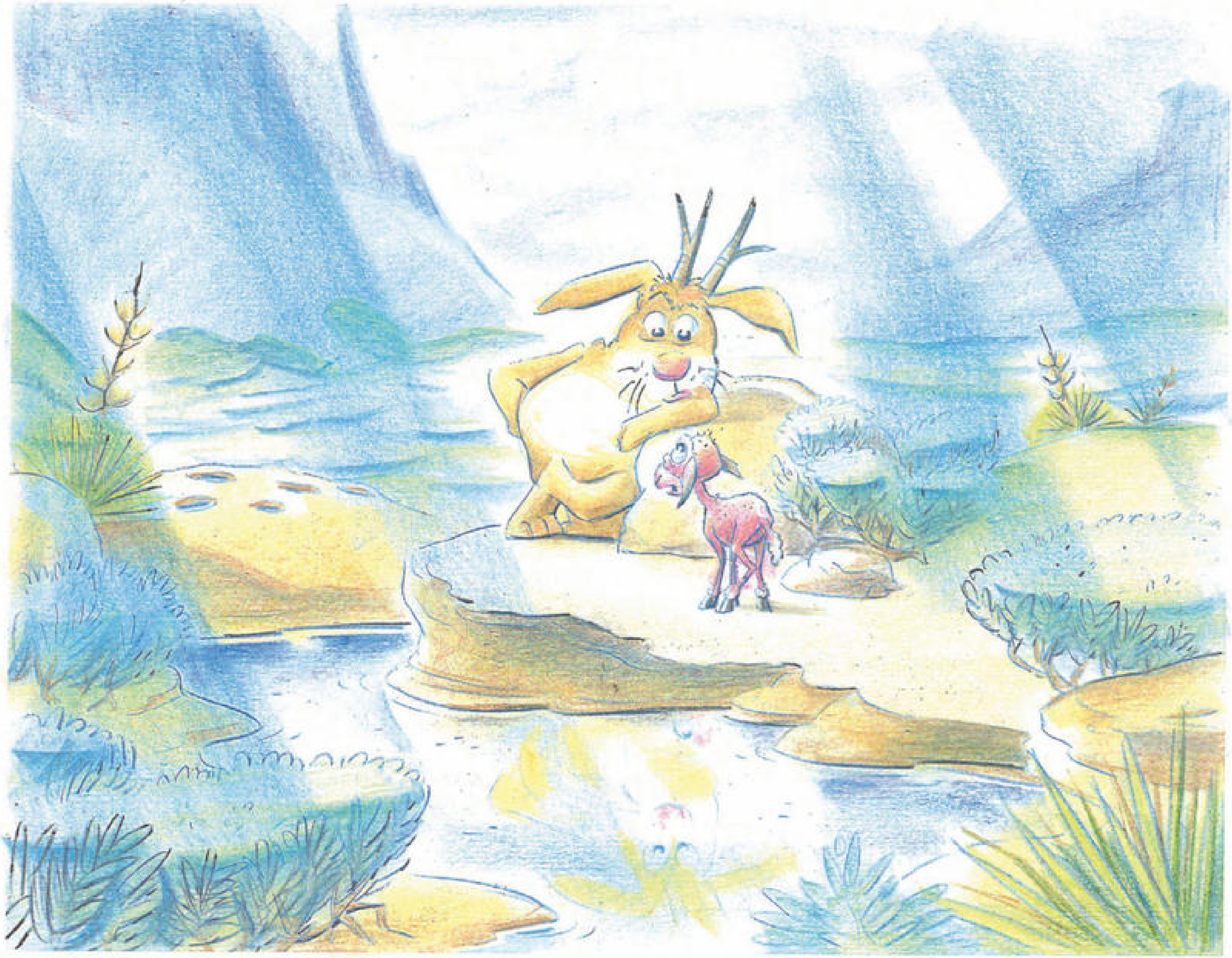
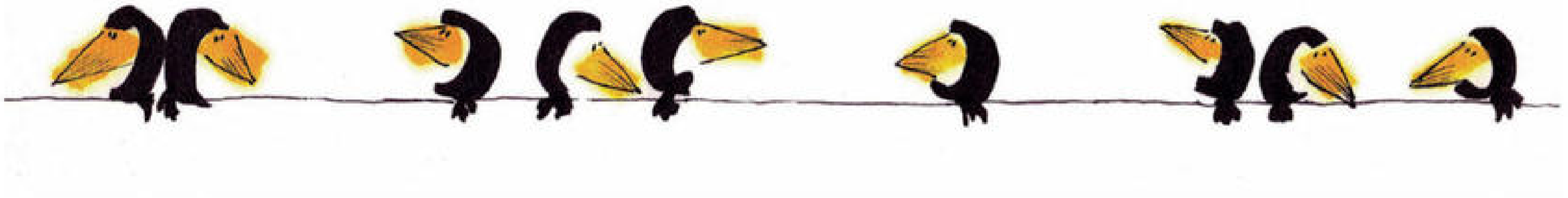


FOREWORD



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One of my most vivid memories of growing up was running home after school to make sure I didn't miss a moment of the cartoons that aired at 4:30 every afternoon. I loved the Disney films, of course, and never missed a chance to see one, but since we didn't have home video back then, they were a rare treat. Looking back, those daily doses of animation—particularly the Warner Bros. shorts—were essential to developing my lifelong love of the medium. So it's no surprise that short films have always had a special place in my heart.

In the old days, animated short films were an established part of the moviegoing experience. Every movie studio had a cartoon studio that made animated shorts, and every feature film had a short cartoon in front of it. As a filmgoer, I've always been sad that this tradition disappeared.

Many people think that because something is shorter it is somehow a "reduced" version of the longer art form: a stepping-stone. This is absolutely not true. Short films and features both have the same goal: to entertain the audience with memorable characters, stories, and images. Because of their smaller scale, short films don't require as many resources—this is why people often get their start making shorts—but from a creative point of view, short films are absolutely their own art. A gem of a short film has a sense of pure joy in animation that is different from anything you see in a feature film.

Here at Pixar, we are proud to have our deepest roots in this fantastic art form, and to be able to continue our work in it today. We prepare for our short films as seriously as we prepare for our features, with beautiful preproduction art and storyboards done by some of Pixar's most talented artists. I'm very proud of their work and I couldn't be happier to be able to give them their moment in the spotlight with this book.

John Lasseter

logo and merry music. The success of this feature prompted the Walt Disney Company and Steven Spielberg's production company Amblin Entertainment to produce the occasional Roger Rabbit short in the 1990s. Disney also reanimated its seminal cartoon star, Mickey Mouse, in the short film *Runaway Brain* (1995). But such experiments were the exception to the rule. That is, until Pixar. In 1998, the company released the animated short *Geri's Game* in front of its second feature, *A Bug's Life*, reviving the Hollywood practice of coupling a short film with the feature.

This was not happenstance or a case of mere nostalgia. Animated shorts were intertwined with the company's history and development. In fact, long before Pixar was a feature-film studio, it was a struggling hardware company that produced a series of short films, going all the way back to that first André and Wally B. short that Lasseter created while the Pixar team was still part of Lucasfilm. The cartoons that Pixar created in the 1980s were not intended for mainstream theatrical exhibition; they were experiments used to help develop their technology—meant to be presented at computer-graphics conferences and at film festivals. In these early shorts, Pixar established its reputation, developed its technological prowess, and learned how to apply traditional animation principles to computer graphics. The technological and artistic advances of the early shorts reached their culmination in the first CG feature film, *Toy Story* (1995).

Even after "making it" in Hollywood, Pixar continued to produce and distribute theatrical shorts periodically. Short films do not generate additional income for a studio since the ticket-buyer is subject to the same price with or without a short, negating a profit motive. But Pixar cofounder and president Ed Catmull explained the studio's rationale for continuing to produce these unprofitable little masterpieces: "Our motivations for shorts have evolved over time, so I don't want to pretend like there's one reason we do shorts. Some of the shorts are driven largely by a desire to develop technology, like [with] *Geri's Game*, which was a project designed to create a convincing human character with skin and clothing."

Another reason for the shorts program is talent development. Pixar is unique among movie studios in that it does not purchase ideas or properties from freelance artists outside the studio. Rather, Pixar invests in people and encourages them to develop ideas in-house. Similarly, most artists are promoted from within, so the shorts are an important training ground for potential directors of features. For instance, Academy Award–winning sound designer Gary Rydstrom tested his mettle as the director of the animated short *Lifted* before moving on to direct the forthcoming feature *Newt*.

Talent development is not restricted to directors. The shorts allow artists and technicians from all areas of the company to move up the ladder and assume greater responsibilities. "Unlike a feature, [for which] people tend to be specialized, on shorts you have more of an opportunity to do a lot yourself because it's a small group," said Catmull. In this way, he described short-filmmaking as a "chance to grow creatively."

John Lasseter, Pixar's chief creative officer, suggested yet another reason why Pixar has continued its short-film program: "I have this philosophy that quality is the best business plan, period, and I always like to overdeliver, no matter what we're making—a feature, a DVD, a toy. We don't advertise the short on the movie poster or in the trailers; [but] when anybody comes to see a Pixar animated film, they get a Pixar short as well. It's kind of an old-fashioned moviegoing experience, whereby you get a lot more for your money."

The films featured in this book may be brief in length, but they were by no means easy to make. An animated short requires the same talents, skills, and technologies that are poured into a feature film of ninety or one hundred minutes. The only difference is one of scale. If a feature film is a novel, then a one-reel short, such as the ones discussed in this book, is a short story. Since a short film has much less time in which to make an impact, every moment must count.

Although each short film produced by Pixar posed its own particular challenges, they all share one common trait: a joy in the endless possibilities of cinema itself. A short cartoon is not, strictly speaking, a commercial product; thus, it is liberated in a way that a feature film never is. The Pixar shorts are sites of experimentation and playfulness; they are somber or silly, moody or mirthful. They take us, briefly, to worlds that are imagined by artists and rendered inside a computer. Their journeys may differ, but the destination is joy.

BEGINNINGS

To understand the development of the Pixar short films, one must first understand the history of the company. The earliest animated short discussed in this book, *The Adventures of André & Wally B.*, was made by the group that would eventually become Pixar, but when they were the Lucasfilm Computer Division.

Following the phenomenal success of *Star Wars* in 1977, George Lucas recognized that the archaic optical-compositing technologies available would become increasingly incompatible with his ambitious vision for the rest of the series. In 1979, he took the unprecedented step of setting up a research-driven computer division at a movie studio. The intention was to modernize all aspects of film production. Cinema was an aging medium. The core technologies were developed in the 1890s, with advances—such as sound and color—made in the first decades of the twentieth century. Lucas had a couple of key technologies in mind: a digital video-editing system, a digital audio system, and a digital optical film printer. Lucas also wanted to develop computer graphics that could eventually be used for visual effects in his features.

Thus, while he was busy producing *The Empire Strikes Back*, Lucas was also on the lookout for someone to run his computer division. This search led to Ed Catmull, who held a Ph.D. from the University of Utah. While still in school, Catmull had helped to pioneer many of the building blocks that would form the foundation of computer animation, among them the z-buffer, texture mapping, and subdivision surfaces. Catmull had a practical reason for developing these technologies: He wanted to make films using a computer. One of Catmull's class projects was a computer-animated model of his own hand. This piece of animation, produced in 1972, was incorporated into the 1976 feature film *Futureworld* (the sequel to MGM's *Westworld*), becoming one of the earliest examples of computer animation in a feature film.

In 1973, while still in graduate school, Catmull visited Walt Disney Productions in Burbank, California. He tried to interest the company's executives in the potential of computer graphics. While impressed by his abilities, the executives simply couldn't imagine that the primitive computer graphics of the time would blossom into an art form. As Catmull recalled, "The technology was not developed enough that you actually could use it in a meaningful way. What we saw was the promise; what they saw was the reality of what it was at the time. They were not used to investing in the future in that kind of way." Instead, Disney offered Catmull a job as an engineer on the Space Mountain attraction, which the company was developing for the Magic Kingdom in Walt Disney World. Catmull declined.

After graduation, he found a more receptive audience in the New York Institute of Technology (NYIT), where Catmull established a computer-graphics research lab. Then he met George Lucas. Catmull's approach appealed to Lucas because, unlike many computer scientists, Ed was not interested in technology for technology's sake; rather, he saw it as a means to a filmmaking end. Lucas recognized that Catmull was the man for the job and hired him to run the entire computer division, composed of four separate units. Catmull, in turn, hired four individuals to head each department: David DiFrancesco for digital film scanning and printing, Ralph Guggenheim for digital video editing, Andy Moorer for digital audio editing, and Alvy Ray Smith for computer-graphics research. Smith was an academic with artistic leanings. After earning a Ph.D. from Stanford University, he worked at Xerox PARC—the famed research division of the company—and with Catmull at NYIT, where Smith developed early computer paint systems.

The computer graphics group of the Lucasfilm Computer Division was largely devoted to solving practical issues associated with digital imagery. These unresolved problems included creating rendering software that could handle the millions of

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11 (left) **Ed Catmull and Alvy Ray Smith discussing *André & Wally B.* Storyboards.** Photograph c. 1984

(right) **Ed Catmull, Alvy Ray Smith** (in a "no jaggies" t-shirt), **and Loren Carpenter in the Lucasfilm graphics lab.** Photograph c. 1984

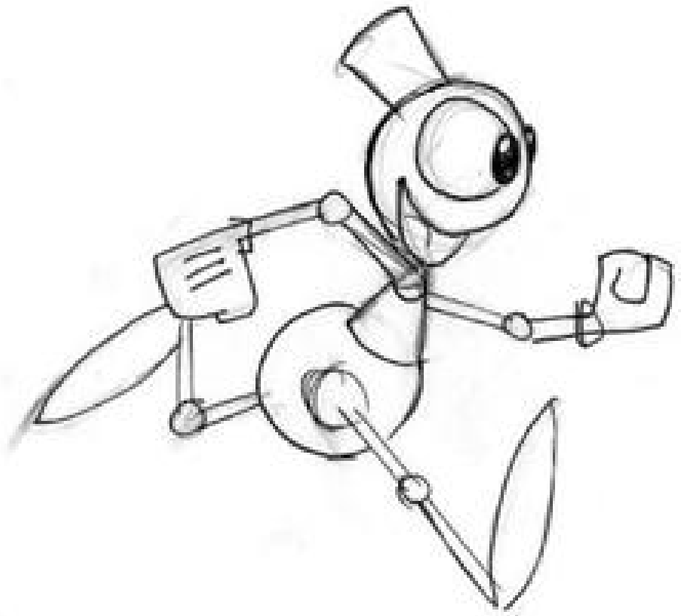
polygons necessary for film resolution; getting rid of the sharp-edged artifacts in CG images, known as "jaggies"; and creating naturalistic "motion blur" that would emulate the blurred image that occurs when an object passes quickly before a motion-picture lens.

Catmull's philosophy was to keep his research and development division open and accessible. He felt that actively participating in the computer-graphics community would help Lucasfilm reach its goals faster. The primary hub of that community was known as SIGGRAPH, an acronym for Special Interest Group on Graphics, which was run by the Association for Computing Machinery. The group's yearly conference was the focal gathering point of the computer-graphics community, and the Lucasfilm Computer Division's graphics group presented dozens of technical papers at SIGGRAPH conferences in the early 1980s. "My belief was that if you participate in that bigger community, you establish relationships; also, the best people coming out of the schools will want to come work for you," explained Catmull. "I think when you get secretive, you actually hold yourself back."

The combination of Catmull's reputation and the allure of joining the force that is George Lucas made the computer graphics group *the* place to work for anyone interested in applying computer technology to filmmaking. Loren Carpenter went so far as to create a two-minute short film, "Vol Libre," for SIGGRAPH 1980 with the express purpose of impressing Smith and Catmull. It worked. Carpenter was hired in January of the following year. Tom Porter, who began at the company that same month, said that, for a computer nerd such as himself, the opportunity to work in Lucasfilm's computer graphics group was "pure sex appeal."

As the division solved technical challenges, it desired an outlet to showcase its work in actual film production. However, such opportunities were limited; the computer graphics group was built to create tools, not to make movies. Special effects were the province of another Lucasfilm division, the highly accomplished Industrial Light & Magic (ILM).

Some opportunities did arise in the early 1980s. The computer graphics group created the "Genesis Effect" sequence for *Star Trek II: The Wrath of Khan* (1982). It is a groundbreaking piece of work: sixty-seven seconds of screen time notable for its "fly-by" camera move. For *Return of the Jedi* (1983), the division contributed a single special effect, the Death Star projection. But Ed Catmull and Alvy Ray Smith wanted to do more—to prove to Lucas and to the world that they, too, were filmmakers.



THE ADVENTURES OF ANDRÉ & WALLY B.

Two days after returning from SIGGRAPH 1983 in Detroit, Alvy Ray Smith and Ed Catmull decided what the Lucasfilm computer graphics group would do next: create a piece of 3-D character animation to show at SIGGRAPH 1984.

Smith, who was in charge of the division, sketched nine thumbnail drawings, which depicted a simple situation: An android wakes up in the middle of a forest, yawns, stretches, and stands up to admire the beautiful scenery. According to Smith, the story symbolized the idea of computer animation itself, waking up to the possibilities of the world around it. Even so, this bare-bones narrative was less important than the technologies it was meant to showcase.

The computer graphics group had several ambitions for this film. First, they wanted to show *articulated* character animation, as opposed to the rigid and mechanical animation that dominated computer graphics at the time. Second, they wanted to have a definite character, instead of a kaleidoscope of various effects. Third, they wanted to prove to their peers at Lucasfilm that they understood cinematic techniques and could be entrusted with production duties on a feature film. Fourth, they wanted to showcase the new technologies they had developed, such as the addition of motion blur to computer-generated imagery.

To accomplish the first two goals, Catmull and Smith turned to someone outside of Lucasfilm. Earlier that year, they had met a twenty-six-year-old Disney animator named John Lasseter. The young upstart had made a deep impression on both of them. According to Smith, Lasseter "was the first animator we had ever met who wasn't scared of us."

As a student at CalArts, Lasseter directed two films that won consecutive Student Academy Awards. When he graduated in 1979, he was hired by Walt Disney Productions to work on its traditionally animated features, such as *The Fox and the Hound*. Although Disney was using the same production methods that had been in place for decades, Lasseter, along with the young animator Glen Keane, helped launch one of the company's earliest forays into computer graphics: a thirty-second animation test based on Maurice Sendak's children's book *Where the Wild Things Are*. This experimental piece combined computer-generated backgrounds with hand-drawn character animation.

While working on the *Where the Wild Things Are* test, Lasseter led the development team of a proposed Disney animated feature titled *The Brave Little Toaster*. Lasseter's aim was to apply his new technique to the feature: place traditionally animated characters against CG backgrounds. After securing the support of Disney executive Tom Wilhite, Lasseter looked for a studio that could produce the digital backgrounds. This search led him to Lucasfilm, based in Northern California, and a meeting with

Catmull and Smith. *The Brave Little Toaster* did not survive Disney studio politics (although it was produced as an independent feature in 1987 by Wilhite's production company Hyperion Pictures). Still, an important connection had been made. Catmull and Smith found an artist who was sympathetic to their technological ambitions.

In the fall of 1983, Smith and Catmull traveled to Burbank for one of their regular visits with Disney brass and technologists. There the two men rekindled their relationship with Lasseter. Shortly after their visit, fate intervened. Lasseter was a casualty of a round of political infighting among studio executives; he was fired from Disney without warning. In November 1983, Lasseter ran into Ed Catmull at a computer-graphics conference. Learning that Lasseter was no longer employed by Disney, Catmull placed a call to Alvy Ray Smith. Smith exclaimed over the phone, "Ed, get off the phone right now and hire him!" Within moments, Lasseter had a job with Lucasfilm Ltd.

Soon the newly minted employee ventured north to meet his coworkers and get briefed on the new project. Smith's original boards were merely stick figures accompanied by written descriptions of each scene. To John Lasseter's art school–trained eyes, there was plenty of room to flesh out the character. Smith, who was the director of the short, encouraged the newcomer to take the reins and said that the character "could look entirely different so long as he remained an android."

Smith also advised Lasseter to design the character using only geometric shapes—ellipsoids, cylinders, spheres—such were the limitations of computer graphics at the time. As a visual guide, Smith gave Lasseter an airbrush illustration by Charles White III called "Running Chrome Man." The chrome man appeared in the book *Air Powered: The Art of the Airbrush*. The glossy technique seemed compatible with the look of computer animation.

With his task in hand, Lasseter returned home to Los Angeles and began to design the character. He struggled with different combinations of spheres and cones sitting on top of one another. "I was having a hard time with rigid geometric shapes," he recalled. Determined to create an appealing animated character, Lasseter looked for inspiration in the earliest designs of Mickey Mouse by famed animator Ub Iwerks. Lasseter realized that the first incarnation of the world's best-known cartoon star was no more than a series of spheres and cylinders. The animation influence took hold, and the Lucasfilm character moved from its android origins to a more traditional cartoon design.

Lasseter hesitated to show his new designs to Smith because they veered so wildly from the original assignment. The drawings did surprise the Lucasfilm crew, who had expected an androidlike figure. Nevertheless, Smith supported the new look; he felt that it was an opportunity to show that computer imagery could depict the visual styling of an artist and not just bare the imprint of a computer. "By the end of the project," recalled Smith, "everyone had forgotten they ever questioned John's designs."

After a second trip north to discuss the project, Catmull and Smith decided to hire John Lasseter on a full-time basis for the duration of the project. There was one problem. Because of policies within Lucasfilm, the computer graphics group was not permitted to hire any "animators"—those were the province of other departments within George Lucas's empire. To sidestep this technicality, Catmull and Smith gave Lasseter the dubious title of Interface Designer.

In 1984, John Lasseter began working full-time at Lucasfilm. His first days were intimidating. "Everybody around me had Ph.D.s," he said. "They were supersmart and were inventing this stuff. And I thought, 'Right. I don't even know how to type! I'm never going to do what they do.' And then I thought, frankly, 'They're never going to be able to do what I do,' which is bring a character to life and give it emotion and personality through pure movement."

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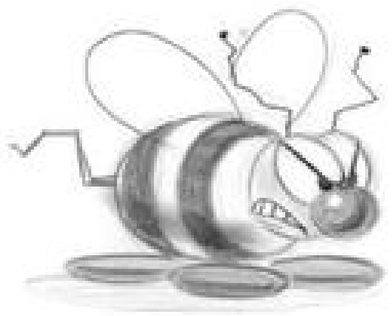
12	**André Concept Art:** *The Adventures of André & Wally B.*, John Lasseter, Pencil, 8½" x 11", 1984
13	**Concept Art:** *The Adventures of André & Wally B.*, John Lasseter, Pencil, 8½" x 11", 1984



Lasseter decided that rather than try to approach their level of technical skill, he would sit right next to the computer scientists and work together toward a common goal. This collaborative spirit between art and technology would become one of the founding philosophies of Pixar. "A lot of the stuff that had been done in computer graphics prior to our collaboration was technology people trying to do everything themselves; the great thing about working together was that we could share our knowledge and experience while breaking down the responsibilities," recalled Bill Reeves, one of the first employees hired by the computer graphics group in 1980.

With Lasseter now on the team, the computer graphics group began to create a computer model of the robot character dubbed "André," which derived from "android." The name was also a cheeky nod to Louis Malle's art-house film *My Dinner with Andre* (1981). As the design coalesced, Lasseter felt that André's torso, which had been modeled using a sphere capped by a cone, was too rigid and lacked the plasticity necessary for expressive character movement.

Fortuitously, Ed Catmull had been tinkering with another shape that he felt could be applied to the character. "I was developing some new mathematical surfaces; and to test out my ideas, I built this teardrop shape," said Catmull. "I actually built the teardrop shape before the film was being worked on."

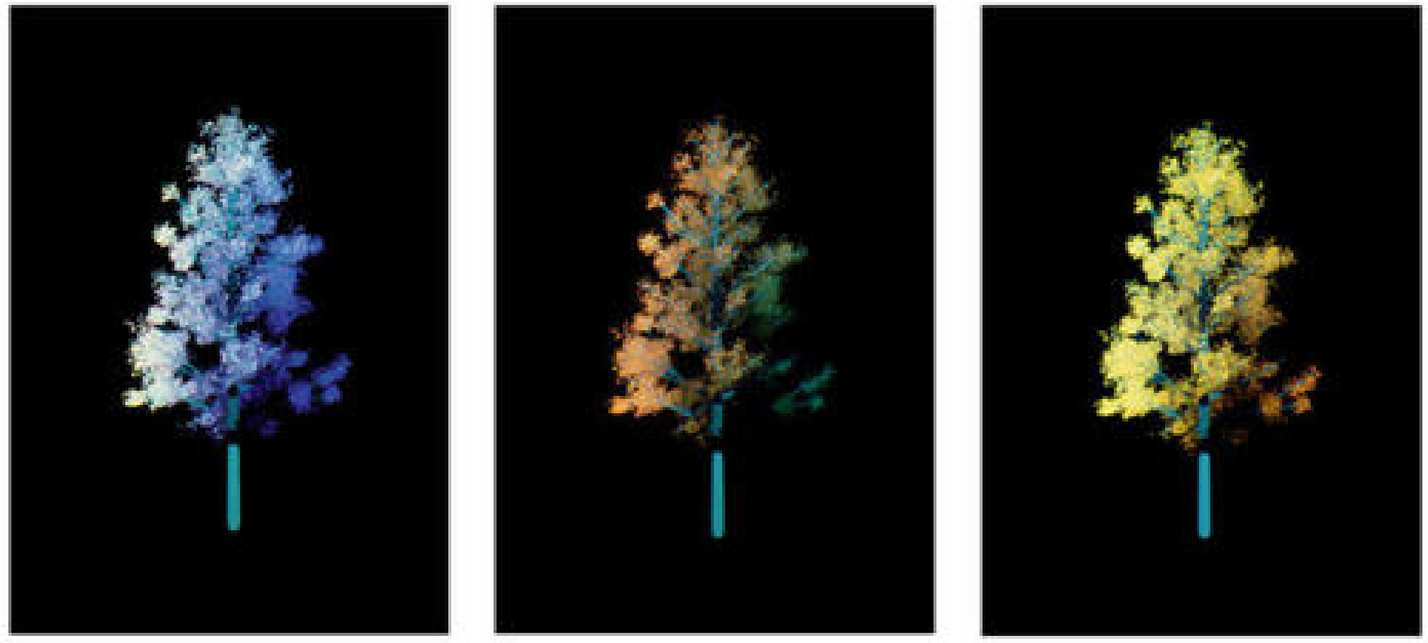
The "teardrop" shape that Catmull invented was precisely the type of flexible, organic shape that Lasseter had in mind because "it had a hemisphere at the top and a hemisphere at the bottom and a [fluid] section in between." Lasseter explained, "I could stretch out the distance between the two hemispheres and change the diameter of each hemisphere; and when I rotated the top hemisphere around the bottom hemisphere, the center section would bend properly. Through that I was able to get a real jellybean-like quality to André's body."

The character's eyes and mouth also required a new technical solution. David Salesin, assisted by Loren Carpenter and Ed Catmull, developed a new form called the "bound," which consisted of a spline-bounded area that followed the curvature of a sphere.

As Lasseter storyboarded the piece, the filmmaker inside him felt that André's actions needed some motivation, some conflict. "It was a little boring with just this character waking up in the woods," recalled Lasseter. Inspired by Catmull's teardrop shape, Lasseter created a second character, a fat bee, who had four teardrops as "water-balloon feet" and a stainless-steel stinger. When it came time to name the film's second character, the filmmakers naturally turned to André's dinner companion in *My Dinner with André*, Wallace Shawn. Thus, the bee was named "Wally B."

The ambitions of the Lucasfilm crew went beyond the desire to create an expressive cartoon character. Every aspect of the project pushed computer graphics to its technological limits, such as the film's use of particle systems that had been developed by Bill Reeves. In computer graphics, particle systems are generally used to model "fuzzy objects"—those that do not have smooth, defined surfaces, such as fire, smoke, and water. Reeves had used his particles to create the fires for the "Genesis Effect" in *Star Trek II: The Wrath of Khan*. Now his task was to implement particles to generate the trees and grass that formed the forest in which André awakens.

To help guide Reeves, Lasseter brought in a stack of *Arizona Highways* magazines that he had borrowed from the Disney reference library. Smith contributed his own collection of *New Mexico Magazines*. The impact of this research was soon felt. Computer scientist Eben Ostby, who joined Lucasfilm in 1983, was impressed by Reeves's trees: "This level of detail and complexity was something that I'd never seen before. One of the first test images was just a spinning tree, and it was unbelievable to see something as detailed and cool-looking as that."



Lasseter stressed the importance of creating color schemes that were artistic, expressive, and nonrealistic. "The way [the technical crew] would approach the issue of leaf color was to take a leaf, put it under a color microscope, and grab the real color of the leaf," Lasseter explained to Lucasfilm historian Michael Rubin. "I told them [that] leaves could be any color, depending on the light. They'd look one way in bright sun, differently on a hazy day. A tree might even look purple." To demonstrate his point, Lasseter would take rough scene renders of the forest by Bill Reeves and, using an early digital paint program, paint over them. Reeves recalled the "eye-opening experience" of watching Lasseter transform one of his renders by accentuating the colors of the shadows and adding a blue-ish tint to the entire image so that the forest popped off the screen. After a crew visit to a downtown San Francisco art gallery to view a Maxfield Parrish exhibit, Lasseter's point became manifestly clear as they all experienced how a traditional painter interprets light and color.

There was, of course, a greater purpose in this drive for naturalism, flexibility, and nuance. John Lasseter was trying to take computer graphics and turn it into cinema. Even the simplest aspects of traditional filmmaking had to be created from scratch inside the computer, such as motion blur, which CG films could not mimic. "Without motion blur," said Catmull, "we could never be in the movies. It was as simple as that. Our success depended on finding a solution."

The computer graphics group—in particular Rob Cook, Loren Carpenter, and Tom Porter—spent more than a year addressing the problem. Eventually, they discovered a solution based on random-point sampling, which could re-create motion blur in the computer. The character animation in *The Adventures of André & Wally B.* was one of the first pieces of computer animation to seamlessly incorporate motion blur into a CG environment.

Meanwhile, Lasseter involved himself in all aspects of the character-animation process. He worked in close collaboration with Tom Duff, who, along with Bill Reeves, developed the program Motion Doctor that allowed the characters to be animated. Lasseter's official title as Interface Designer suddenly became relevant when he made suggestions to Duff about how to revise the system to make it more accessible to anyone trained in hand-drawn animation. One change, according to Alvy Ray Smith, was that "computer scientists always number from zero, but animators always number from one. So Tom changed his zero-origin displays to one-origin displays."

As Lasseter animated the characters, he began to ask for more controls on the models. Each new control enhanced the type of personality animation that had heretofore been absent in computer animation. By the time the film was completed, the André model had 547 animation controls and the Wally model had 252.

SIGGRAPH 1984 drew nearer, and the crew scrambled to finish the film. The computer graphics group had only two VAX

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15	**Tree Test Render Studies:** *The Adventures of André & Wally B.*, Bill Reeves, Digital, 1984

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16	**Concept Art** (detail): *The Adventures of André & Wally B.*. John Lasseter, Pastel, 13" x 10", 1984
17	(left) **Luxo Motion Study:** *Luxo Jr.*, Digital, 1984
	(right) **Luxo Frame Model:** *Luxo Jr.*, Digital, 1984

computers on which to render images, but there were three more in other Lucasfilm divisions: the Games Group, ILM, and the finance department. Bill Reeves co-opted all three after hours to harness the computing power he needed to render the forest scenes (which feature a grand total of 46,254 trees). When all five of Lucas's computers proved to be insufficient, Reeves enlisted the help of a friend who worked on MIT's digital initiative, Project Athena. The university donated computational time on its ten VAX 11/750s.

Meanwhile, Rob Cook and Loren Carpenter, whose rendering system REYES now included motion blur, needed to render the film's characters. With all of Lucasfilm's computational power monopolized by Reeves, they contacted Cray Research, Inc., which manufactured the fastest supercomputer at the time, the Cray XMP. The company agreed to let Lucasfilm implement REYES on its in-house machines in Mendota Heights, Minnesota. Thus, *The Adventures of André & Wally B.* was rendered simultaneously in California, Minnesota, and Massachusetts.

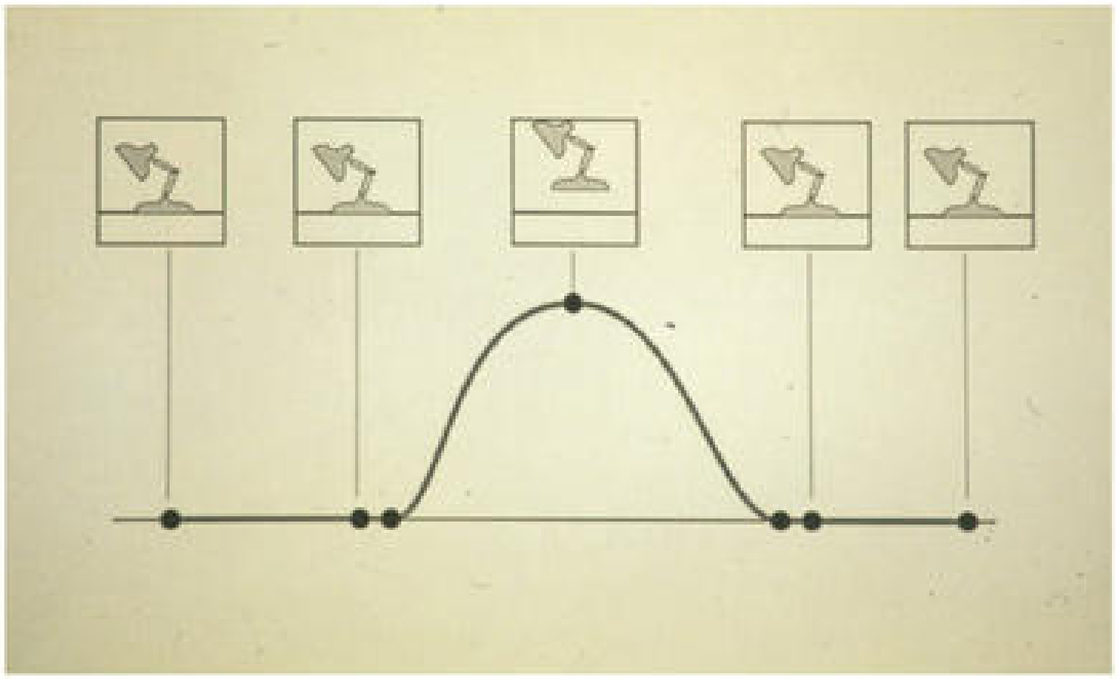
Cook and Carpenter traveled to Mendota Heights. They were joined by Eben Ostby, who helped them adapt the REYES software to Cray's machines. The film's characters were rendered and composited against Reeves's backgrounds at the Cray facility. In a paper that Alvy Ray Smith wrote after the film's completion, he described Cook and Carpenter's fierce dedication to the project: "During the final week of computations before SIGGRAPH '84, Rob [Cook] got four hours of sleep in a week, and Loren [Carpenter] got six! They literally hand scheduled the four processors of the Cray XMP-4 and the two processors of the Cray XMP-2 to keep all six CPUs operating at close to one-hundred-percent capacity."

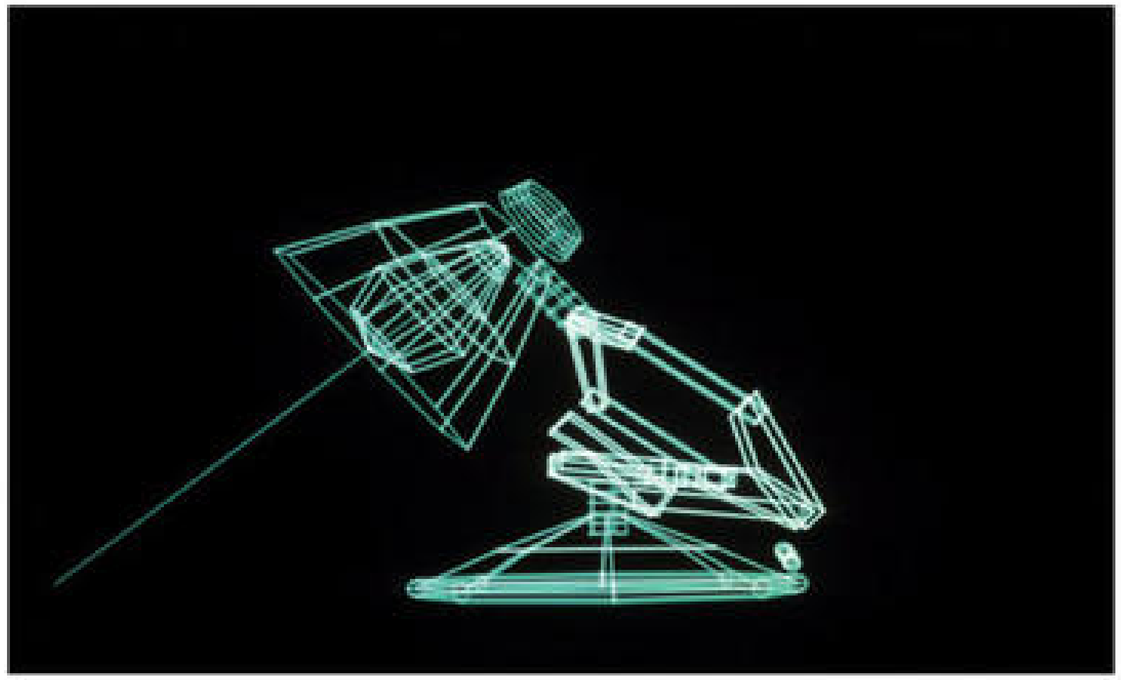
At one point, the team from Lucasfilm had even taken over the terminal of Cray's founder, Seymour Cray, in the rush to render the film in time for SIGGRAPH.

Despite valiant efforts, the film was not completed by its SIGGRAPH debut on July 25, 1984. All the backgrounds were rendered, but towards the end of the screening, the animation switched from fully rendered characters to wire-frame "pencil tests." The audience was so enthralled by the vivid personality animation that many did not even notice the switch. The fully rendered film premiered a month later at the International Animation Festival in Toronto.

To audiences accustomed to the heights to which computer animation would later ascend, *The Adventures of André & Wally B.* may seem primitive. Running two minutes, the story is simple, almost a sketch. André wakes up, comes face-to-face with Wally the bee; there is a chase, then an off-screen climax. Still, it is a groundbreaking piece of work. The Lucasfilm group took the field of computer graphics and dragged it forcibly into the realm of cinema. Moreover, in the early 1980s, one could not walk into a shop and buy a software program to make such a movie; the computer group had to invent each tool as it went along.

This short film can claim one more achievement. It carried John Lasseter the few hundred miles from Walt Disney Productions, with its pencils and light boards and drawings of Mickey, to Lucasfilm, with its computers and programmers and pixels. Thus, the film set the template for the soon-to-be-born Pixar: the marriage of art and technology, cartooning and computing, the visionary and the scientist. André and Wally B.'s adventures were the first, but more would follow.





LUXO JR.

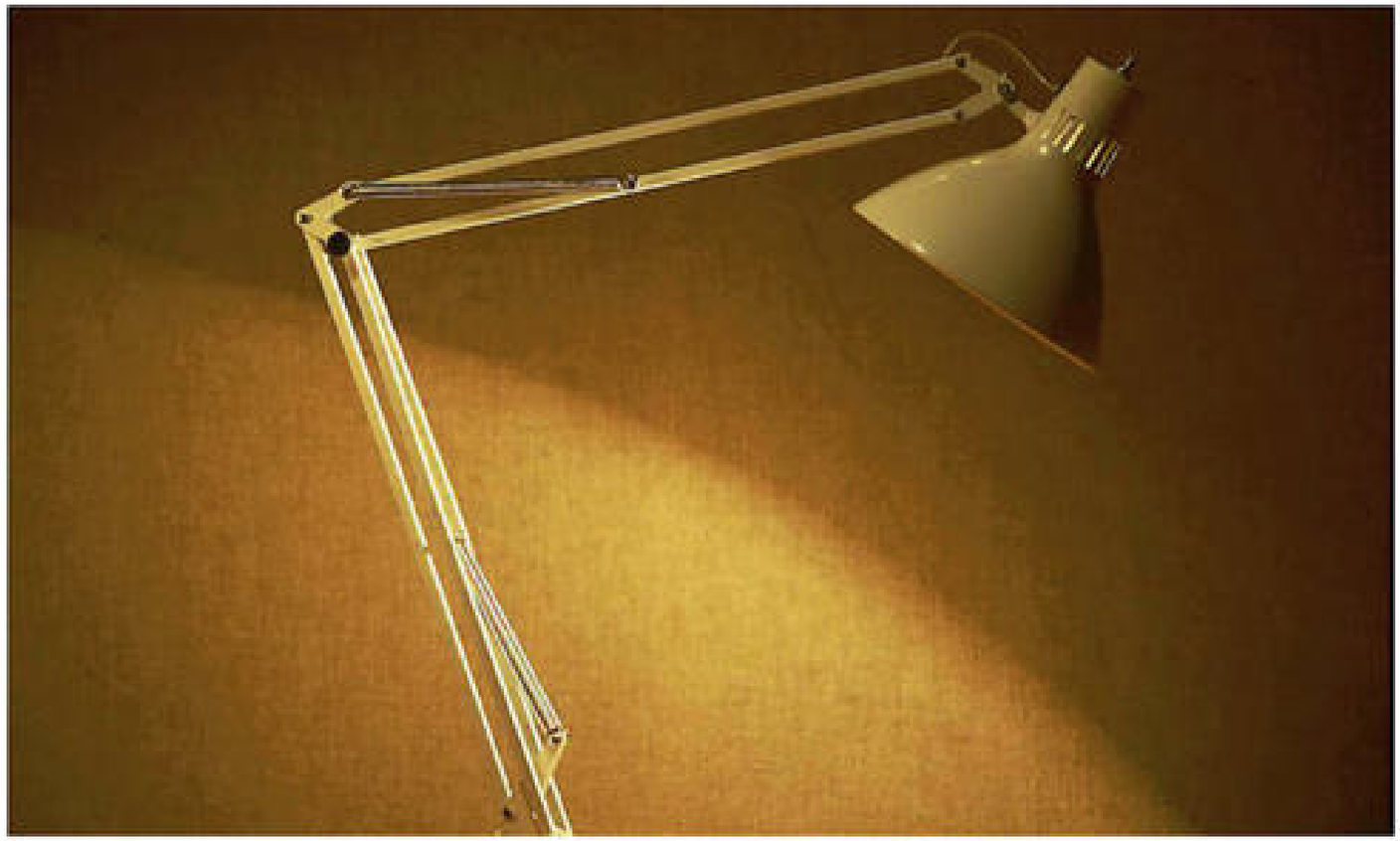
As *Steamboat Willie* was to Walt Disney and his studio, *Luxo Jr.* was to John Lasseter and Pixar: the company's breakthrough animated short. Each film announced to the world its creator's distinct vision. *Luxo Jr.* is also Lasseter's professional directorial debut.

Luxo Jr. began production while the animation group was still a part of the Lucasfilm Computer Division. In February 1986, former chairman and cofounder of Apple Computer Inc., Steve Jobs, bought the computer graphics group of Lucasfilm, and the group was reborn as Pixar. *Luxo Jr.* debuted in August 1986 at SIGGRAPH as the first official Pixar short.

Luxo Jr. is simplicity itself. A father lamp and a son lamp play with a ball; the youngster makes mistakes; and the parent shows forbearance. What is most striking about the film is its look. Computer artists at the time were fascinated by the possibilities of the medium. Their animated shorts display an embarrassment of riches—rotating cameras, crystal balls, chrome logos, reflective and refractive surfaces—as if to say, "Look what we can do!" *Luxo Jr.*, in contrast, stood out in this hyperkinetic field in part because of its conspicuously spare look: a locked-down camera, a simple plane of wood, and a pitch-black backdrop.

The austere design of the film was as much a necessity as an artistic choice. At the time, the animation group at Pixar was composed of only four people: John Lasseter, Bill Reeves, Eben Ostby, and Sam Leffler. And the group had even fewer computers than crew members. At night they would borrow computers from other departments at Pixar and purloin precious moments of computing time. Under these circumstances the unit did not have enough computing power to execute moving cameras or detailed backgrounds. These limitations worked in favor of the filmmakers, though, because the audience's attention would be directed at one thing and one thing only: the characters. Against the neutral background, the characters seem more real—as if they are there, passing the time, being and behaving.

In a mere two minutes of action, the film captures the highs and lows of a typical father-son relationship. We see the patient exasperation of a father lamp, portrayed through subtle dips and shakes of the lamp's head, and a child's curiosity and playfulness brought to life with flopping lamp cords and springy extensions of his little lamp arms. Despite this simplicity, *Luxo Jr.* took some time before it developed into even this bare sketch of a story. The project began when Lasseter asked if he could learn how to model a character in the computer, which, in those days, was a laborious task that required typing lines of code into a text-editing program. He chose to model the Luxo lamp on his desk, primarily because it was there. Later, he created animation studies using the lamp and presented these during a lecture at an animation festival in Belgium.



At the festival, one of the artists impressed with the animation was Belgian animation legend Raoul Servais, who had directed one of Lasseter's favorite animated shorts, *Harpya*. When Servais asked Lasseter about the project's story, Lasseter responded that it really didn't have much of a story; it was just a character study. Servais countered that any piece of animation, no matter how short, can and should have a story with a beginning, a middle, and an end.

Lasseter took the advice to heart. When he returned to Pixar in San Rafael, he began to think of ways to create a story with the lamp. Inspiration arrived in the form of one Spencer Porter, the young son of Pixar technical director Tom Porter. Lasseter was amused by the comical proportions of the infant relative to the adult—the child's oversized head and stubby limbs. In a flash, Lasseter decided to model a baby lamp.

In a SIGGRAPH paper that Lasseter wrote after the film's completion, he noted the importance of clearly delineating the designs of the father and child lamps: "The feeling of a baby lamp and a grown-up lamp was very important. The effect was achieved using exaggeration in proportion, in the same way a puppy is proportioned very differently than an adult dog, or a human baby is different from an adult. The lightbulb is the same size on [Luxo] Jr., while the shade is smaller. The springs and support rods are the same diameter as Dad's; yet they are much shorter."

In a case that is unusual among the Pixar short films, Lasseter did not have a clear ending in mind when he started animating. (Typically, a storyboard details the entire narrative before production begins.) When Lasseter began the animation, all he knew was that the film would have a father lamp, a son lamp, and a ball. This almost stream-of-consciousness method lends the film some of its lightness and vitality.

The deceptive simplicity of *Luxo Jr.* masks two important technical advances. The first involves the nature of the characters Lasseter chose to animate. Unlike typical cartoon characters, lamps are their own light sources. Both Luxo Sr. and Luxo Jr. have electric lightbulbs inside their swivel heads, casting light and shadow in any direction. To achieve a realistic effect, Bill Reeves, David Salesin, and Rob Cook developed a self-shadowing algorithm, which computes clean edges resulting in anti-aliased shadows. "Bill came up with the idea of this kind of depth map that was an image rendered from the point of view of the light source," explained Lasseter. "Instead of storing information on the color of the objects in its view, it stored information on the distance to other objects. If one object appeared in the depth map before another, you knew that the former should cast a shadow on the latter. If nothing in the depth map appeared before an object, it was not in shadow and would be fully illuminated." The result seems effortless, and it gives credibility to the characters on screen. To Lasseter, it was a "perfect matching of technology and subject matter."

The second technical breakthrough was Eben Ostby's advances in procedural animation. This gave Lasseter control over the timing and movement of the rolling beach ball and obviated the need to tediously animate the ball frame by frame. Lasseter

vividly recalled his earlier suffering when he tried to make the patterned ball roll properly on the ground using only keyframe animation: "I [was] sitting there in front of these very expensive computers, with a hand calculator using my simple art-school math, trying to figure out, 'If a ball is this size and it's moving this fast, how far would it move?' What's wrong with this picture?" Pixar would continue to refine its procedural animation system on future shorts, including the wheels turning on the unicycle in *Red's Dream* and the animation of the snow in the snow globe in *Knick Knack*.

In addition to its technical achievements, *Luxo Jr.* marks the first collaboration with sound designer Gary Rydstrom, who would become an integral part of Pixar's creative team in both short films and features. Rydstrom was a budding sound designer working in Lucasfilm's sound group, Sprocket Systems. In his work with Pixar, he decided that the sound effects should not be too "cartoony." Rydstrom wanted the sounds to be funny and exaggerated but rooted in some semblance of reality. "I thought my job was to give [the lamps] vocalizations that did in sound what John was trying to do with the animation, which is stay true to them being lamps but give them life," recounted Rydstrom. He produced the desired effect by combining the sounds of lightbulbs turning in sockets and metal scraping against metal.

Luxo Jr. debuted at SIGGRAPH 1986 with two other short animation tests that Pixar created. Lasseter's little film about the two lamps startled the six thousand computer programmers and assorted technical geeks who were in attendance at the Dallas Convention Center Arena. Thunderous, prolonged applause followed the debut.

The film went on to win dozens of awards at film festivals, and it earned another important distinction: an Oscar nomination for Best Animated Short—the first fully computer-animated film to garner that honor. Luxo's life did not end there. In 1991, Pixar created four additional shorts starring the Luxo lamps for the children's television program *Sesame Street*. The spots teach basic concepts, such as the differences between light and heavy, up and down. In recognition of his status as the company's breakthrough cartoon star, Luxo Jr. serves as the studio's unofficial mascot: He hops around the Pixar logo that precedes every theatrical release.

The success of *Luxo Jr.* caused one unanticipated problem: Pixar had used the name of a trademarked product without permission. This misstep was hastily corrected by Ralph Guggenheim, a veteran of NYIT and Lucasfilm, for which he headed the development of Lucas's EditDroid editing system. Guggenheim, who joined Pixar's animation group around the time *Luxo Jr.* premiered at SIGGRAPH, immediately contacted Jac Jacobsen Industries to clear the use of the name. Computer animation was so new that the Luxo representatives could not even understand what Pixar had done. "They thought we had taken two of their lamps and animated them by hand in stop motion," said Guggenheim. The notion of computer animation was still unfathomable for most of the public. Ultimately, Pixar and Luxo reached an agreement in which Luxo could screen the film at its own trade shows and Pixar could distribute the film without restraint.

With a running time of about two minutes, *Luxo Jr.* exceeded everyone's expectations. In addition to its many accolades, the film became an effective recruiting tool for the burgeoning animation studio. Many artists who later joined Pixar, including Pete Docter, Jan Pinkava, and Bob Pauley, cited the film as one that opened their eyes to the possibilities of computer animation as an art form. Pauley, a production designer on *Cars* and *Monsters, Inc.*, said, "When I saw *Luxo Jr.* . . . you could tell [that the filmmakers] cared about character; they cared about character animation. It's beautiful—there's a story, there's heart; and I thought, 'I just want to work there.'"

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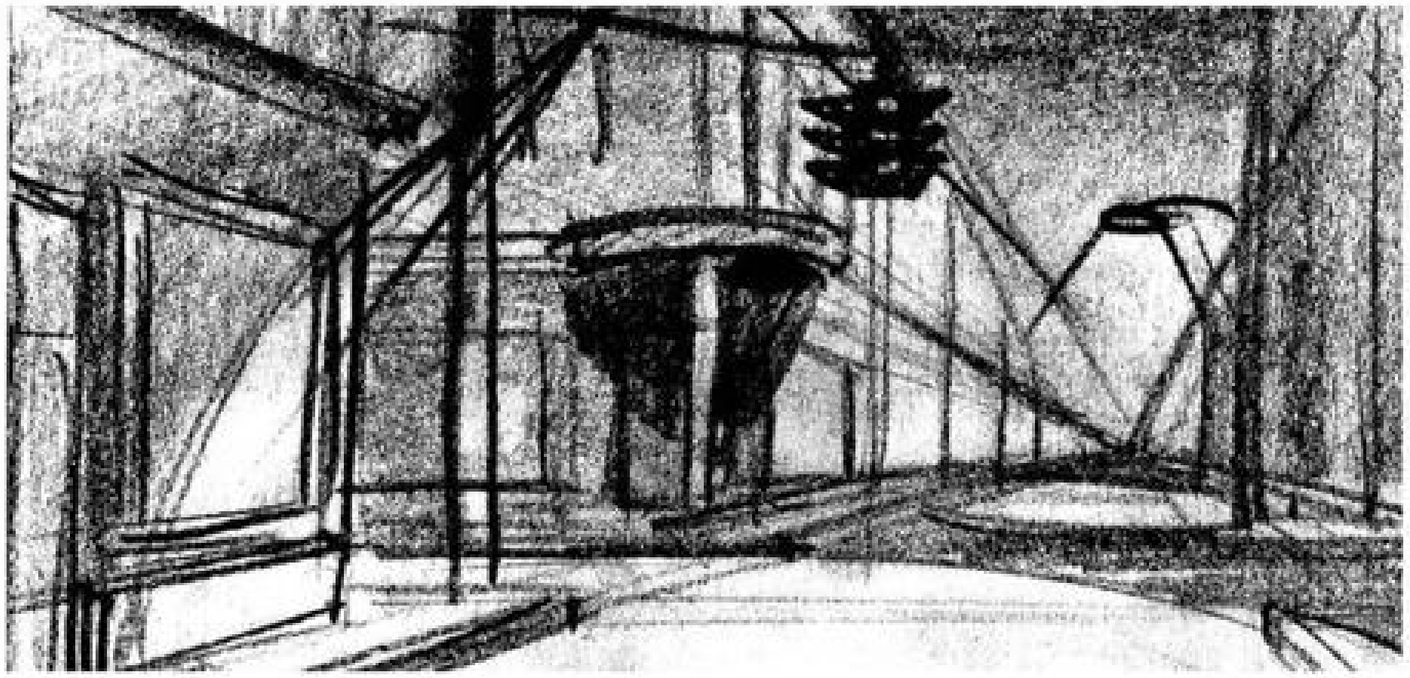
18	**Reference Photo:** *Luxo Jr.*, Photograph c. 1986
19	**Concept Art:** Luxo Jr., John Lasseter, Marker, 1986



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20	**Rainy City Street at Night Storyboard** (detail): *Red's Dream*, John Lasseter, Marker & Pencil, 8½" x 11", 1987
	Concept Art: *Red's Dream*, John Lasseter, Marker, 1987
21	(left) **John Lasseter with Unicycle Reference**: *Red's Dream*, Photograph, 1987
	(right) **Film Still**: *Red's Dream*, 1987

RED'S DREAM

It was a moment that John Lasseter would not soon forget. He had organized a daylong course on character animation for the SIGGRAPH 1987 conference in Anaheim, California, and had invited his former Disney mentors, Frank Thomas and Ollie Johnston, to participate. Earlier in the afternoon, Thomas and Johnston had spoken to the attendees about their experiences during the "golden age" of animation. The veteran animators had stressed that computer animation would reach a similar level of accomplishment only when its artists were able to elicit emotion and pathos from their computer-generated characters.

Now it was Lasseter's turn to speak. As part of his presentation, he screened the newly finished film *Red's Dream*. When the presentation ended, Thomas and Johnston barreled forward, eager to shake the young man's hand. "You got it! You got the pathos!" they exclaimed. "They were so excited," Lasseter later recalled.

As he had in *Luxo Jr.*, Lasseter managed to express emotion through an inanimate object—in this case, a unicycle. However, the technological star of the newer film was not the inanimate object; it was the clown who rides atop the unicycle. This was the studio's first attempt at an organic facial shape. Looking back at the film some years later, however, Bill Reeves joked, "I'm not sure if you'd call it that anymore."

Lasseter insists that one of the keys to believability in any animated film is the use of organic shapes. The clown, who was cheekily dubbed "Lumpy" by the crew, was a significant advance in that direction. Creating the clown was a particular challenge for the fledgling Pixar crew. Lasseter remembered a brainstorming session with Bill Reeves and Eben Ostby. Playing the gadfly, Lasseter paced the room and thought aloud, "I know the teardrop and what it's made up of. What if I sculpted something with a much more organic shape, so it doesn't look so geometrically perfect, and we digitized it using the exact same number of points that the teardrop has?

Intrigued, his collaborators fell in with his thinking. Someone suggested that he first sculpt the clown's head in clay. "Then Eben would take the data and put the same kind of controls over it, like the teardrop," recalled Lasseter.

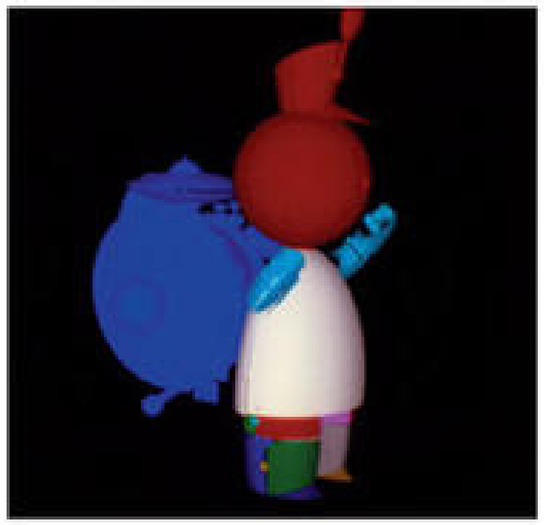
The piece of hardware that made this possible was a 3-D digitizer produced by Polhemus Navigation Sciences. The Pixar crew had previously employed the digitizer on the "stained glass" knight in *Young Sherlock Holmes* (1985), which is one of the earliest examples of a CG character in a feature film. Now Lasseter could sculpt a clown's head, draw grids on top of it, and slowly drag the digitizer's wand like a pencil over the object's surface to record a point-set.

In addition to provoking such moments of inspiration, Lasseter fused the talents of those around him. At SIGGRAPH 1986, Pixar had presented three separate pieces of animation: *Luxo Jr.* and two technologically driven animation tests (*Beach Chair*, by Eben Ostby, and *Flags and Waves*, by Bill Reeves and Alain Fournier). Lasseter recognized that they could accomplish more by combining their talents into a single project. Like many

animation pioneers before him, he used what he had at hand. Bill Reeves was further exploring particle systems and rain. To make his project more fun, he built a city set and attempted to create an atmospheric night scene, with falling rain and street lamps reflecting in the puddles below. At the same time, Ostby, who was an avid biker, was at work on a complex model of a bicycle, with accurate spokes and hubs. With a painterly city scene on the one hand and a realistic bicycle on the other, Lasseter conceived a moody tale of a unicycle who dreams of becoming the star attraction at the circus.

Lasseter combined these elements with his own desire to create an organic character. In the dream sequence, however, the clown is upstaged by the talented unicycle. It is he who finishes the performance and receives the adulation of the crowd. When the dream is over, the unicycle finds himself in the corner of the shop, alone and unwanted. Lasseter resisted the suggestions to give the film a happy, Hollywood ending. To the contrary, the film concludes on this melancholy note. Lasseter later quipped that the sad ending made the film a hit in Europe. In fact, in 1988, *Red's Dream* won the top European prize for computer animation, the Prix Ars Electronica.

In addition to the elegiac ending, *Red's Dream* is distinguished—and unique in the Pixar canon—because the unicycle's dream sequence is the only major work created by the animation group that was rendered with the company's flagship hardware product, the Pixar Image Computer. Ed Catmull wanted the film to be a showcase for the powerful capabilities of this piece of hardware. Pixar employees wrote a special version of the REYES rendering software called ChapREYES that could specifically render scenes on the Image Computer. Whether the company would ultimately be known for its hardware or for the fanciful dreams of its animated creations was still to be discovered.



TIN TOY

During the production of *Red's Dream* in the spring of 1987, the animation group realized that Pixar had outgrown its animation software, Motion Doctor. Now the tool was showing its age. The organic clown had brought the system to a near standstill. "Interacting with the animation was so slow, it was just killing me," Lasseter recalled. He compared it to writing on a word processor in which each letter typed on the keyboard would take five minutes to appear on the screen. Whereas his animation mentors, Thomas and Johnston, could convey their ideas instantaneously with the dexterity of a pencil on paper, Lasseter was inhibited by technology. Something had to be done.

As early as 1986, the Pixar animation team had recognized the need to develop a more robust and powerful piece of animation software. One weekend in the fall of 1986, they drove in a caravan up the California coast to Stillwater Cove. There the Pixar team held a retreat for a few days in which they brainstormed ideas in a free-for-all fashion. Among those present were Bill Reeves, Eben Ostby, Rob Cook, Loren Carpenter, Sam Leffler, David Salesin, and John Lasseter. The white paper they collectively wrote in Stillwater Cove became the foundation for the new piece of modeling and animation software that they would introduce with *Tin Toy*: Menv (short for modeling environment). "Stillwater was a seminal meeting for Pixar's modeling and animation technology," recalled Reeves. "Without those ideas and the software that grew from them, Pixar's feature films would not have been possible."

Whereas the Motion Doctor animation software had been designed prior to John Lasseter's arrival at Lucasfilm, Menv was designed from the ground up to accommodate the workflow of a traditionally trained animator like Lasseter. The fundamental idea behind Menv was to create an animation program that separated the various steps of the CG pipeline (modeling, animation, lighting) into quick-loading modules. The program also had to be infinitely customizable and extensible so that it could grow over time to meet the increasingly sophisticated demands of the studio's character animation.

In the estimation of Bill Reeves, the production of *Tin Toy* was the most difficult thus far. Multiple new pieces of technology were incorporated into the production pipeline. In addition to Menv, there was the debut of RenderMan, the studio's groundbreaking piece of shading and rendering software. It was within this challenging production environment that John Lasseter decided to up the ante once again. The Pixar crew would attempt one of the greatest challenges in animation: to create a human character. Even the early Disney animators, masters of Mickey Mouse and Donald Duck, struggled when they had to draw a convincing boy or girl. Now, all these years later, could pixels create a believable human?

Computer animation, still in its infancy, would now tackle the notion of creating a baby. The idea was suggested by Bill Reeves, who had his first child, Julia, in 1986. Lasseter liked the idea of a baby but did not have a story to go with it. Then, as fate would have it, he watched a home video of his nephew, Timmy. In this video, Timmy sits upon a blanket and plays with his toys, as children will do. This simple document was fascinating to Lasseter, who studied it with a keen animator's eye. He noticed that every toy the baby touched went directly into his mouth. Lasseter thought to himself, "Wow, can't imagine being that toy. That baby would be a monster!" Such was the spark that Lasseter needed. He would create a film that looks at the baby—and the world—from the point of view of a toy.

It was far easier to generate this story than to create a baby inside the computer. Despite the crew's earlier experience with the organic clown face in *Red's Dream*, a baby presented a new set of challenges. Most animation succeeds because no one really knows how a Woody Woodpecker might walk or how a Wile E.

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22	**Test Render of Tinny**: *Tin Toy*, Bill Reeves, Digital, 1988
23	(left) **Sculpture of Baby's Face**: *Tin Toy*, John Lasseter, Cast Urethane Resin, 11½" x 14½", 1988
	(right) **Bill Reeves Mapping Baby's Head**: *Tin Toy*, Photograph, 1988

Coyote might fall from a cliff. But a human baby is something with which every audience member is familiar. One false shake of the rattle and the audience will know the character to be inauthentic—the illusion shattered.

The first challenge for Lasseter and Reeves, who took the technical lead on the baby, was to understand how a face and its muscles work. They drew upon the SIGGRAPH paper by Keith Waters entitled "A Muscle Model for Animating Three-Dimensional Facial Expression" and considered the research of Paul Ekman and Wallace V. Friesen, who, in the late 1970s, had developed the Facial Action Coding System (FACS). This system identified each muscle in the face and examined how contractions of individual and grouped muscles registered expressions and emotions.

To apply these findings to the task at hand, Lasseter and Reeves bought a baby doll at Toys"R"Us, drew a grid over its face, and digitized it using the Polhemus. After they had modeled the baby in a neutral facial position, Reeves wrote software that allowed the muscle structure to be placed over the grid. As each muscle on the grid contracted, the points on the face would move under a set of weights so that each point would move a slightly different amount. To achieve complex facial expressions like a smile or frown, Reeves created macro-muscles, which assigned individual scaling parameters and weights to groups of muscles, thus allowing them to behave in a coordinated fashion. Lasseter likened this process to "sculpting the facial expressions." The range of controls that Reeves implemented in the system permitted flexible and asymmetrical facial expressions, one of the keys to creating a convincing human character. Perfect, geometric shapes may be symmetrical, but actual humans are asymmetrical, lopsided, flawed.

Once Lasseter and Reeves had discovered how to apply a convincing muscle structure to the test baby's face, Lasseter proceeded to sculpt a much larger head out of clay. They then repeated the grid creation and digitization process. "When you look at it today, you sort of go, 'Ooh! That's a weird-looking baby,'" said Reeves. The lumpiness of the baby was a by-product of what happened when Reeves and Lasseter digitized the clay model, as well as the kind of spines they were using. "The clay was soft. . . . As we would push the point of the Polhemus wand into the clay, sometimes it would go deeper than other times," recalled Lasseter. "When you connected it all together with a single surface, it looks like he has cellulite. So he looks a little weird, but it works for the story because he's supposed to be a baby monster."

The visualization of tin toy Tinny proved a breezier affair. Lasseter had begun collecting toys when he worked at Walt Disney Productions, and he had amassed a fairly sizable collection, including windups and tin toys. He had also been inspired during a trip to Japan in 1987, when he had visited Kitahara's Tin Toy Museum in Yokohama.

Lasseter designed Tinny as a one-man band. This presented a wealth of aural opportunities to the film's sound designer, Gary Rydstrom. Rydstrom gave Lasseter specific musical beats to animate to, but adding the sound afterward was a particular challenge. Using the Synclavier, an early RAM-based sampler and synthesizer, Rydstrom created a rich, layered soundtrack that had to reflect the emotions and moods of Tinny. In one inspired moment, Tinny decides to flee the baby Godzilla. When the tin toy tries to sneak off, however, the thumping drum and crashing cymbals of his wardrobe threaten to give him away. For a musical toy, it is difficult to escape unheard. "The complication for sound in *Tin Toy* was to make it sync up with the animation," Rydstrom recalled. "John didn't animate the cymbal and drums with the idea of what music he would play. It was just kind of a pattern."

More than *Luxo Jr.* and *Red's Dream*, *Tin Toy* seems less like an experiment and more like an actual film. Some shots are positively cinematic, such as the point-of-view through the translucent plastic of the toy box: We see a warped image of the baby as he stumbles ahead. The world of living toys and their perspective on our world—its terrors and delights—would be something to which the Pixar crew would return. But that was still to come.

KNICK KNACK

In the early years of the studio, Lasseter would often animate until dawn, followed by a quick catnap under his desk, and then begin work again the next morning. Bill Reeves recalled that during the production of *Tin Toy*, he would stay at the studio with Lasseter until 2 or 3 a.m. but would then head home to be with his wife and young daughter. Despite their best efforts, the complexity and technical ambition prevented the Pixar animation crew from completing *Tin Toy* in time for its scheduled SIGGRAPH debut in August 1988. Instead they screened an unfinished preview print of the film with a "To Be Continued" title card inserted at the moment when Tinny becomes trapped in the toy box.

Production on the film continued through the summer and fall of 1988. When the film was finished, Pixar submitted *Tin Toy* for Oscar consideration; it won the 1989 Academy Award for Best Animated Short Film—the first fully computer-animated film to ever do so. This was a milestone in animation and a proud moment not just for the small animation crew but for the entire company. Pixar rented a large-screen television, and employees gathered at the San Rafael headquarters to watch John Lasseter and Bill Reeves stand before a crowd of Hollywood celebrities and accept the Academy Award—the same Oscar that had been won in the past by Walt Disney, Friz Freleng, Chuck Jones, and William Hanna and Joseph Barbera. Computer animation had arrived.

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24	(left) **Pixar Production Crew during Knick Knack** (clockwise from top left): Ralph Guggenheim, Eben Ostby, Deirdre Warin, Dan Conway, Yael Milo, Tony Apodaca, Bill Reeves, Flip Phillips, Craig Good, John Lasseter. Photograph c. 1989
	(right) **Film Still** (with Betty's original design): *Knick Knack*. 1989
	(bottom) **Storyboard** (detail): *Tin Toy*, John Lasseter, Pencil, 5½" x 4", 1988

Earlier, in June 1988, as Lasseter hastened to complete the SIGGRAPH preview version of *Tin Toy*, he saw a film that embodied what had drawn him to animation in the first place: *Who Framed Roger Rabbit*. "It just blew me away," recalled Lasseter. "The opening in *Roger Rabbit* was phenomenal and a throwback to the cartoons that I love: the Chuck Jones and Tex Avery cartoons." But this refreshing moment would also foster a rude awakening for him: "I came back [to the studio], and I was looking at what I was working on at the time, *Tin Toy*. And I kind of got depressed, thinking, 'Man, our characters are just standing still. Where is that cartoony animation that I've always known?' It seemed that I'd kind of reduced myself to minimal animation, although that was appropriate for the characters in the film." Since he grew up enjoying the manic cartoons of Jones and Avery, Lasseter feared that his own films lacked that cartoony joie de vivre.

Thus, he decided that Pixar's next film, *Knick Knack*, would be a gag-driven, Warner Bros.–style cartoon. This instinct coincided nicely with the general feeling of the animation group. While Lasseter craved an aesthetic unfettering, the others looked forward to a technological respite. As producer Ralph Guggenheim put it, they decided that one goal for the next project would simply be "not to kill ourselves."

Eben Ostby, who took the lead on technical direction for the first time on *Knick Knack*, remembered that "there was the sense that this film was one that we were doing to consolidate our gains and see if we could do something more fun." The intention was to apply "all those tools that we'd laboriously developed" to something entertaining, breezy, and just plain funny.

In keeping with the more modest technical ambitions of the new film, Lasseter put aside the 3-D digitizer that he used to model the circus clown in *Red's Dream* and the baby in *Tin Toy*. Instead, he designed the type of characters that the computer does best: figures made of simple geometric shapes. Inspired by his wife Nancy's extensive collection of snow globes, Lasseter concocted a tale of a snowman trapped in a snow globe who longs to join the warm-weather knickknacks on the opposite side of the shelf. The cactus, the pyramid, and the pink flamingo seem to be having more fun, as they bop lightly to Bobby McFerrin's infectious music. In particular, the lonely snowman casts his charcoal eye upon a buxom, sunbathing beauty—a souvenir tchotchke from Miami.

Every frame of the film and every note of the music is designed to evoke a retro-kitschy feel. Even the wallpaper that stands as a backdrop to the tacky souvenirs is informed by this retro vibe. The idea for the wallpaper came from a book that was popular among Pixar employees at the time, *Googie: Fifties Coffee Shop Architecture*, which celebrates a cool brand of 1950s modernism.

Knick Knack was also an important developmental step in the animation group's internal structure. By the time the film was made, the animation staff was expanding and Lasseter's role shifted from that of an animator who animated every single shot of a film to that of a director who oversaw the work of an entire crew. In *Knick Knack*, Lasseter still animated all of the major characters, but the animation cycles of the secondary knickknacks were created by the modelers who had designed them.

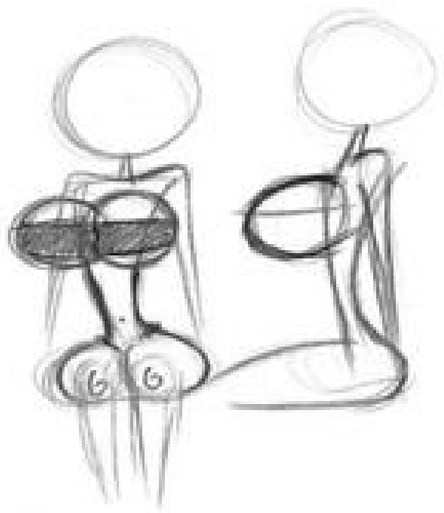
Whereas *Luxo Jr.* was "written" by Lasseter almost as he animated the film, here the authorship became more collective. "There were a couple of sessions where we were all crammed into John's office," recalled Flip Phillips, who was a member of the animation department. Every member of the team contributed to the story. For example, the snow globe falling into a fishbowl was suggested by Phillips, and the subsequent gag, in which the snowman Nick discovers a well-endowed mermaid in the fishbowl, was the idea of Deirdre Warin, the coordinator of the animation department. Another crew member, Craig Good, suggested the "iris out" ending that immediately followed Warin's gag, a nod to classic Hollywood cartoon endings.

Lasseter was proud of the film's collaborative spirit. To commemorate this group effort, he chose to forgo a sole directing credit. In its place stands a "Film by" title card that lists all ten members of the animation department.

As a challenge, Lasseter and his crew designed the film in stereoscopic 3-D; thus, 3-D glasses were required when the film premiered at SIGGRAPH 1989. More recently, a 3-D version of the short was attached to the 2006 Disney Digital 3-D rerelease of *Tim Burton's The Nightmare Before Christmas*. There is one part of the film however that is no longer as 3-D as in the original 1989 release of the short. In 2003, when Pixar rereleased *Knick Knack* with *Finding Nemo*, the company attracted a torrent of criticism for a decision to reduce the breast sizes of the sunbathing blonde and the mermaid whom the snowman fancies. The online furor that erupted was soon noted by the mainstream news media and took Lasseter by surprise. "Everyone thought it was big bad Disney coming in and insisting we do this, and really it was our own choice," said Lasseter. "It was just crossing the line for me personally as a father, so I made the decision to reduce her breast size."

In the fourteen years that separate the film's first release from its much wider later release, the target audience had changed significantly. The original SIGGRAPH and film-festival audiences, comprising bearded hackers and bespectacled film students, probably enjoyed the disproportionate proportions of the two lovely lasses. However, by 2003, now under the imprimatur of Walt Disney Pictures, *Knick Knack* was to be seen by millions of parents and their children. Lasseter admitted that the decision drew wary comments even within the studio, but he maintains that it was the right thing to do. It is the latter version that was included in the *Pixar Short Films* DVD collection in 2007.

When the media called Pixar for comment, the official response was that the Miami blonde had reduced her breast size because she wanted to be taken more seriously as an actress—a line that Lasseter credits to director Roger Gould.



POST–KNICK KNACK

The Pixar Animation Group was something of a paradox. It was part of a for-profit company, but its shorts films never earned a return on their investments. While the animation group was busy making art, Pixar itself was selling hardware and software—its core businesses. In 1989, the animation group was approximately ten people in a corporation of more than one hundred employees. Any reasonable business-school graduate or efficiency expert could correct this conundrum at a glance. The animation group is unproductive and unprofitable: Get rid of it.

Ed Catmull, however, kept his eye on the prize: to make a computer-generated feature film. He knew that maintaining the animation group was essential to achieving that goal. The technology was not mature enough in the 1980s to tackle a feature. Nonetheless, instead of simply investing in hardware, as competing companies did, Catmull supported the quixotic Pixar Animation Group. With each short film, these artist and technicians made discoveries and honed their skills as filmmakers. Each film brought them a step closer to the day when the capabilities of the hardware and sufficient computational power would conspire together to let them make a feature film.

Still, the animation group realized during the production of *Knick Knack* that to continue making short films in this manner was simply unsustainable. If they were ever to reach their goal of creating a CG feature film, they needed to become more commercially viable. After many internal discussions, the Pixar Animation Group wrote a memo, which they presented to Chuck Kolstad, the president of Pixar at the time. Producer Ralph Guggenheim, who drafted the final document, recalled a three-point plan that would generate revenue and allow them to expand the animation group. The three stages were:

1. Begin producing television commercials to bolster the animation group financially and allow it to hire new talent.

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26	**Betty Model Packet Drawing:** *Knick Knack*, John Lasseter. Pencil, 8½" x 11", 1989
27	**Concept Art:** *Geri's Game*, Jan Pinkava. Pencil, 8½" x 11", 1997

2. After expanding production capacities through commercial production, sell a half-hour television holiday special, to be financed by a third party (such as a network).

3. Using the experience of TV commercials and the long-form holiday special, create a full-length feature film.

The plan was approved by Pixar's upper management. By 1990, Pixar embarked on the first stage of its plan: making television commercials. By the end of the year, the animation group gained a new prominence within the company when Pixar sold off its hardware division and began to reposition itself as a filmmaking company. Then the pace accelerated. The second step of the three-step plan was eliminated: there would be no holiday special. In 1991, Pixar signed a deal with Walt Disney Studios—the company synonymous with animation throughout the world—to produce a feature-length animated film, *Toy Story*.

The short films had fulfilled their technical and aesthetic purposes: The Pixar crew was now ready for the challenge of making a CG feature film. But Pixar was not about to abandon the short form upon which it had built its reputation. Luxo and Red and Nick the lovesick snowman would be joined by another generation of short-film creations in just a few years' time.

GERI'S GAME

During the production of its first feature, *Toy Story*, Pixar maintained its TV commercial division. According to Ed Catmull, "We thought we had to keep on making commercials to stay alive until we got to our second film." Thus, the studio hired Jan Pinkava, in 1993, to supervise the commercial output.

Pinkava had been a longtime admirer of the Pixar shorts and, in fact, had submitted his résumé to the studio because of his desire to create shorts of his own. Almost as soon as he arrived at the studio, Pinkava suggested that the commercial unit produce a short film during the downtime between projects.

The opportunity to direct a short, however, did not present itself until the mid-1990s, when Ed Catmull and John Lasseter decided to revitalize Pixar's short-film division.

The studio had halted short-filmmaking during the hectic years of production on *Toy Story*. Creating the world's first feature-length computer-animated film, Pixar itself was on the line. Every available resource would be poured into the feature. Once *Toy Story* was released, in 1995, the film's financial and critical success permitted the luxury of some reevaluation. Hereafter, Pixar would be a company dedicated to making feature-length cartoons.

The second feature, *A Bug's Life*, was already in development. It would have been easy to dispense with the short-film program. Every film studio in Hollywood had done so decades earlier. The rationale was simple: Short films don't make money; features do. But Catmull believed that short cartoons needed to remain a part of Pixar's future. "The short as a pure art form is important to us," insisted Catmull. He felt that making short cartoons kept Pixar connected to the wider world of animation—students, independent animators, and filmmakers around the world who carry on the short-film tradition of Felix the Cat and John Hubley. "We love it when other studios [make short films]," Catmull said. "We like it when there are all these individual artists who show up at Annecy [the international animation festival] . . . . We're part of a bigger community, and we want to be responsible members of that community."

In addition to this noble sentiment, the short films of Pixar would continue to serve a pragmatic purpose as well. Without the commercial risks and high costs of a feature film, the short is the perfect place to try new ideas, develop burgeoning talents, and finesse new technologies that could then be applied to feature films. Just as Walt Disney's short cartoons in the 1930s proved a fertile training ground for his eventual features, Pixar's short films would serve as research and development—with the

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28	**Film Stills:** *Geri's Game*, 1997
29	**Concept Art:** *Geri's Game*, Jan Pinkava, Pencil, 12½" x 10½", 1997

added bonus that the end result could also entertain an audience. In particular, in the years following *Toy Story*, Pixar was focused on creating smooth skin surfaces and realistic cloth simulations in their shorts, both of which were necessary for the creation of believable human characters.

In short, short films would endure. Pinkava was thrilled when Catmull offered him the opportunity to direct one. But there was a catch. Catmull said that the short could be about anything, as long as it included a human character. Pinkava was at a loss: "I had drawers full of ideas for shorts that were things that the medium could do well—but not a single one with a human character in it."

Despite this hurdle, Pinkava's background made him uniquely suited to answer Catmull's challenge. An animation enthusiast since childhood, Pinkava was awarded in 1979 the top prize in the Young Film-Maker's Competition, which was presented by the BBC children's show *Screen Test*. Pinkava was also interested in computers and programming. He studied computer science and eventually earned a Ph.D. in Theoretical Robotics. Pinkava would merge his artistic and scientific knowledge in the making of *Geri's Game*.

Of course, the first step was to come up with an idea. Pinkava decided early on that the film would feature only one human character; thus, everyone's efforts would be focused on making that character as vivid and believable as possible.

In *Tin Toy*, Lasseter depicted a human baby. Now Pinkava would skip several generations and portray an elderly man. He sketched a few different storylines: in one, an older gentleman plays with an elevator in his apartment building; in another, an old codger gets embroiled in a battle with a greedy duck, who envies his lunch. Another idea was more experimental: a little old man pitted against himself in a vigorous game of chess. Pinkava was inspired by his grandfather, who used to play chess against himself. "I thought, 'How could you do that [when] you know what you're going to do next?" The director mused upon the story's metaphysical aspects as well. Intrigued by the idea of the split personality, Pinkava took inspiration from the absurdism of Monty Python and the cinematic playfulness of Norman McLaren.

With a suitable storyline in hand, Pinkava turned to the task of designing the main character. In this case, the director, born in Czechoslovakia, had to look no further than the work of Czech filmmaking legend Jirí Trnka, whose puppet-animated films and children's book illustrations are fondly remembered by generations of Czechs. An accomplished sculptor himself, Pinkava also studied the works of figurative sculptors, such as Rodin, Degas, Vigeland, and Daumier.

The initial design of the old man, Geri, proved to be easier than the technical hurdle of creating smooth, pliable skin surfaces. Prior to this film, the surfaces of characters had been modeled using NURBS technology. The patch-based CG models created

with NURBS often tore apart at the seams during the animation process; this made it difficult to maintain the smoothness of a character's skin. On a complex model, like that of Woody in *Toy Story*, extensive manual effort was required to hide the seams in his face.

Pixar technical director Tony DeRose, who is praised by Ed Catmull as "one of the world's leading experts in surface mathematics," embraced the challenge of developing a new surface-modeling technology called "subdivision surfaces." Catmull himself had pioneered the concept while still a student at the University of Utah and had further developed it with Jim Clark (cofounder of Silicon Graphics, Inc.) in the late 1970s. Subdivision surfaces had been used in animation as early as the mid-1980s, but DeRose took the concept to a new level, extending its ability to add creases to an object's surface.

DeRose's subdivision-surface technology was then used by technical director Paul Aichele to build the digital model of Geri's head, which included hundreds of facial controls; these allowed the animators to create subtle expressions. Subdivision surfaces were also used to model the skin of Geri's hands and his clothing. The subdivision surfaces were so clearly a better way of modeling organic objects that Pixar took the unusual step of implementing the technology on *A Bug's Life*, even though the feature was already in the middle of production.

The other technical challenge in *Geri's Game* was the need to create a dynamic clothing simulator that accurately matched the movements of the character. To ask an artist to manually animate the folds and creases in a piece of cloth would be unfeasible even in a large-scale production. The simulator needed to look and feel like cloth, or the illusion of realism would be diminished by the character's weird, plate mail–like costume. Technical director Michael Kass spent a year refining the simulator so that Geri's jacket looked and moved like actual cloth.

"The cloth would look like concrete; it would look like Jell-O; it would look like strange stuff," said Pinkava, remembering the technical difficulties. "You'd come in and look at dailies every morning, and you'd see that the jacket had exploded; or it just stayed on one side of the screen while the character walked to the other side of the screen. . . . We finally beat it into submission so that it looked like cloth."

Once the cloth simulator started working properly, the crew realized how poorly they had tailored Geri's suit. "We didn't know anything about tailoring," admitted Pinkava. When Geri lowered his arms, the cloth of his jacket bunched up beneath his armpits. "So the simulator was working really well, but our tailoring was terrible."

On one of Steve Jobs's visits to the studio, Pinkava described their tailoring problem, and Jobs promptly responded that he knew just the man who could help: Giorgio Armani. "But we figured it out without Armani," Pinkava said with laughter.

In 1998, Pixar's first short film in nearly a decade was released to great enthusiasm. Like *Tin Toy*, *Geri's Game* won an Oscar for Best Animated Short. The latter film resembles *Luxo Jr.* in that the audience's focus is entirely on the character. Geri is so convincing a figure that we are apt to forget that he is composed of pixels. In his game of chess, on a pleasant afternoon outdoors, he proceeds to outsmart himself again and again, with a feigned heart attack and other ploys. While clearly an old man, he possesses the playfulness of youth. Perhaps not surprisingly, the film appeals to adults as well as children. Pinkava said that he was frequently approached by parents who would tell him how much their three- or four-year-olds enjoyed the film.

Another fan of *Geri's Game* was animation director Brad Bird, who was working on a traditionally animated feature, *The Iron Giant*, for Warner Bros. "*Geri's Game* made me feel confident that my problems with CG films could be addressed," said Bird,

"because here was a human that was stylized, yet had credibility. It looked like there were bones and flesh, and it felt tactile and fleshy." Bird recognized elements of the animation masters whose work he admired, such as the Disney animator Milt Kahl, "who drew stylized and caricatured figures that had weight and mass." When Bird arrived at Pixar a few years later, he would embark on creating the studio's first feature with an all-human cast, *The Incredibles*.

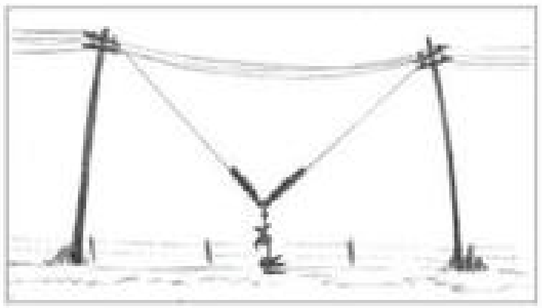
FOR THE BIRDS

Edgar Allan Poe, in describing his theory of what makes a good poem, identified a few essential traits: brevity, beauty, logic. When Pixar's Ralph Eggleston considered the poetics of the animated short, he offered three vital elements: brevity, clarity, sincerity. *For the Birds*, which Eggleston directed, proves a textbook case of all three. One of Pixar's shortest shorts, *For the Birds* packs many laughs into its brief running time. It's perhaps no surprise that Eggleston cites the swiftly paced Walt Disney 1941 classic *Dumbo* as his favorite animated feature.

For the Birds began its life in the early 1980s, as a design assignment that Eggleston created for design instructor Bob Winquist's class at CalArts. Fellow classmate Ken Bruce suggested that Eggleston turn his concept sketch into a film. "I actually boarded out some of it at CalArts," remembered Eggleston, "and I couldn't finish it because I dreaded the idea of having to draw all those little birds." Since his idea also lacked an ending, he filed the project away for another day. Nonetheless, Eggleston found Winquist's class invaluable. "I learned more about film-making and storytelling in his class than at any other class at CalArts, mainly because [Winquist] was a big believer in limitations. How economical can you be? What's the fastest way to put an idea across to an audience? He used these wonderful design assignments, like asking us to describe a character's personality through just a handful of objects arranged in a particular way. It was mind-bending."

Although Eggleston is better known as an art director on Pixar films such as *Finding Nemo* and *WALL·E*, prior to his arrival at the studio in 1993, he had worked primarily as an animator. He said that he "fell into art directing by accident," and he sees himself less an artist than a filmmaker—someone who is "always trying to think of character and story and how it all fits together."

As Pixar prepared to resume a slate of short films, the studio held an open call for ideas in the late 1990s. Eggleston dusted off his unfinished CalArts project. When he revisited his youthful work, he replaced the original flamingo with a nondescript but rather goofy bird. During the pitch, Eggleston used an old car horn for the sound of the loony animal, which made John Lasseter laugh. Such colorful sound effects remained through the production. To create the sounds of the small birds, Eggleston used squeaky toys from the collection of Pixar storyboard artist Jeff Pidgeon.



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30	**Early CalArts Concept Sketches:** Ralph Eggleston, Marker, 1985
31	(left) **Gagboard**: *For the Birds*, Jeff Pidgeon, Pencil, 5½" x 8½", 2000
	(right) **Storyboard** (detail): *For the Birds*, Ralph Eggleston, Pencil, 8½" x 5½", 2000

Eggleston's economy—his mastery of limitations—is evident throughout the film, particularly in his decision to use a single design for the entire group of small birds. This uniformity heightens the glaring contrast between the small birds and the large outsider bird. At one point in the production, Eggleston began to worry that the design of the small birds might be too simple. So he tried to investigate the underlying anatomy and bone structure of the little birds. When he presented a revised version to John Lasseter, "John just literally smacked me and said, 'Stop it! Go back to the storyboard drawings!'" chuckled Eggleston. The director realized that the earlier design was closer to his original intention to keep it cartoony.

The effortlessness of the finished film belies two years of toil that Eggleston invested into it. The ending, in particular, was a challenge. "I had to reboard the ending probably twenty or thirty times because it just wasn't funny," recalled Eggleston. Other artists, including Jeff Pidgeon, made suggestions. Story artist Joe Ranft contributed an inspired climax in which a bunch of rabid weasels leap out of the bushes and eat all the birds. In another unused ending, the birds are electrocuted to a crisp and wind up as a bucket of fried chicken.

Eggleston labored on *For the Birds* in whatever free time he had between feature assignments. In the process, he created literally hundreds of storyboard drawings, which supervising animator Jim Murphy and his team followed carefully. As director, Eggleston supervised every aspect of the production, from the animation to the inventive sound design, which he recorded with Jory Prum. No detail was too insignificant for the director to notice. When the little birds are violently shot out of frame, their features were reanimated multiple times before Eggleston felt that the desired effect was achieved.

He also worked closely with his supervising technical director, Bill Wise. Eggleston remembered their collaboration with fondness: "We're both misfits, so we were able to work very well together." The director credits Wise with working on camera and layouts, overseeing the modeling of the characters, and dealing with effects and lighting. According to Eggleston, "He worked his tail off on the film."

For the Birds earned Pixar a third Oscar for Best Animated Short. To Eggleston, such accolades were beside the point. He merely wanted to entertain audiences with his film: "It's not trying to solve the world's problem. It's just trying to make somebody laugh."

BOUNDIN'

He walked into the studio's open-pitch session with his banjo, sat down, and plucked at the strings. Then Bud Luckey sang, with his gentle cowboy drawl:

> *Here's a story on how strange is life with its changes.*
>
> *And it happened not long ago.*
>
> *On a high mountain plain, where the sagebrush arranges*
>
> *A playground, south of the snow. . . .*

It was one of the easiest decisions that John Lasseter ever had to make. He knew that Pixar had to produce this short. The man who played his banjo for Lasseter and his associates that day was noted for his gentle, easy-going manner. When he spoke, it was barely above a whisper; someone only a few feet away might have difficulty hearing what he had to say. Here was not a young hotshot looking for his big directorial break. Rather, Bud Luckey was Pixar's oldest employee; he was born in Billings, Montana, in 1934. When he joined the studio in 1992, he was already an animation veteran who had directed dozens of shorts and commercials in more than thirty years in the field.

Although he had not had much experience with computer animation, Luckey was fascinated by the possibilities of the

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32	**Owl Concept Art** (detail): *Boundin'*, Bud Luckey. Pencil, 17" x 11", 2003
33	**Film Still:** *Boundin'*, 2003

medium. "Even when I was a 2-D animator, my head was in 3-D," he recalled. "When I had a studio of my own doing commercials, I spent a lot of time trying to put in shading and shadows with Magic Markers. I remember spending all-night sessions using Magic Markers and then running out into the street to throw up because the fumes were horrible."

His impact on the Pixar oeuvre was indelible, felt from the studio's very first feature, *Toy Story*. Luckey changed that film—and perhaps Pixar's future success—when he made the inspired suggestion to change the character of Woody from a tuxedo-clad ventriloquist doll into a cowboy.

Bud Luckey brought to Pixar a lifetime of experience. He was a graphics specialist with the NATO Allied Occupation Forces in Europe and North Africa; in art school he roomed with pop artist Ed Ruscha; in the early 1960s, Luckey's mentor was animation legend Art Babbitt; later, Luckey served as an advertising agency art director in San Francisco. He was perhaps best known for animating classic *Sesame Street* segments, such as "Ladybugs' Picnic," "Infinity (That's about the Size of It)," and "The Alligator King."

These experiences culminated in his achievement with *Boundin'*, a short film remarkable for its unaffected charm, with nary a hint of cynicism or self-reflexive irony. In a bucolic expanse of the American plains, a sprightly lamb loses his self-esteem when he is shorn of his beautiful wool. The scrawny figure that remains is a fragment of his former self. Like the biblical figure Samson, he is lost without his hair. Then a jackalope, the great Western mythical combination of a jack rabbit with the horns of an antelope, introduces the little lamb to the notion of boundin'—literally jumping high in the air with joy. It is a simple tale that allows its audience to encounter the wisdom that is gleaned through decades of experience: Life may tear you down, but you can always bounce back.

Roger Gould, the codirector of *Boundin'*, stated unequivocally, "The film is Bud Luckey. This is really Bud's childhood. He always said that [while growing up in Montana] the saddest thing he ever saw was a shorn sheep in the rain. So that was the pivotal creative image that drove the whole short. And he said as an animator, he always loved to make characters jump. So a sad sheep in the rain plus jumping equals *Boundin'*."

Early in the production, Luckey invited Gould, the creative director of Pixar's shorts group, to codirect the film. "I was just helping Bud out a little bit," recalled Gould, "and after a while, he just said, 'Would you like to codirect this thing, because I don't actually know how we make stuff here?'" Gould accepted without hesitation.

Luckey's modesty belies the fact that he knew exactly what he wanted as a filmmaker. Steve Bloom, the editor of *Boundin'*, said that Luckey's clear vision was part of the appeal: "[Bud] had everything on the storyboards." Luckey knew exactly the colors he wanted. He knew how he wanted the characters to move. He'd even written the song and lyrics. Unlike the creative free-for-all that might accompany the development of a new short, *Boundin'* was very much the director's film. According to Doug Sweetland, the film's supervising animator, "It was prepackaged Bud." Luckey credits the years he spent in the fever-pitched advertising world for teaching him how to make confident and clear decisions as a filmmaker. "In advertising, you know it has to get done and you don't have much time to do it," he said.

Although Luckey was now working for a company that had pioneered CG character animation, his approach was charmingly old school. For example, when it came time to choose the color palette for the film's characters and backgrounds, Luckey indicated his preferences by cutting Pantone color chips and taping them next to his drawings. "We don't really deal in Pantone chips too much anymore," laughed Tia Kratter, the film's art-direction consultant. "He had all these little chips

glued to eyeballs and things, so I could go in and speck textures and colors." For his backgrounds, Luckey took inspiration from traditional artists as well, including the American painter Grant Wood and the Disney conceptual artist Mary Blair.

In addition to the technological contrast, there was a generation gap between Bud Luckey and most of his crew. Luckey was a full two decades older than even John Lasseter, and some on the *Boundin'* team remembered watching Luckey's *Sesame Street* segments when they were children. Doug Sweetland believed that the pieces were the earliest animation he had ever seen. So when the chance arrived to work with their creator, Sweetland "jumped at the opportunity. . . . He's a huge hero of mine." The generation gap was further pronounced by Luckey's cultural frame of reference, which dated to a period before some of his animators were even born. For the jackalope, Luckey envisioned an Edgar Buchanan or Wallace Beery type; for the lamb the model was someone more like Wally Cox. The crew thus experienced a priceless film education. Sweetland was excited to be introduced to "a whole area of filmdom that I'd never seen before."

To complement the rustic charm of Luckey's narrative and music, he directed his animation crew toward a more direct school of acting. Sweetland explained, "Typically in features, Pixar animators strive to be as real and psychologically complex as possible." In contrast, he suggested that the characters in *Boundin'*, like

Hollywood actors of the 1930s and 1940s, give performances that were externalized—akin to Wallace Beery and Greta Garbo rather than Robert Redford and Meryl Streep.

Another source of influence was one of Luckey's animation heroes, Disney veteran Ward Kimball, a master of funny, offbeat animation. Luckey cited a scene in the cartoon *Toot, Whistle, Plunk and Boom* (1953) in which child birds play in a school band. According to Luckey, "There's one little bird that beats a drum, and all he does is walk in a dumb circle. That's funny. I call it dumb-ass animation." To maintain such a comedic spirit, Sweetland strived to capture the down-home charm of Luckey's pencil-drawn character designs in the computer. Sweetland recalled that Luckey "kept on directing us to make it sillier and goofier."

Some directors are tyrants, some are manipulators, some are just boundin' with enthusiasm. "He was so pleased by whatever people did," said Bloom. "In animation dailies, there would be animators who would show their first initial pass, which is the blocking take. The character is moving a little bit, but the subtlety isn't there yet. But Bud would say, 'That's great. I don't need to see it again. Let's see another shot.'" Kratter said that working on the film was "a pleasure from beginning to end. It was low-key just like Bud, very easy and really fun."

There was, however, one "crisis" moment during production, and it can be summed up in one word: sagebrush. When it was time to color and texture the sagebrush in the background, it seemed that no one could get it right. Luckey had in mind a specific variety of sagebrush that he remembered from his childhood in Montana. The problem was solved only after Luckey went on vacation and returned with stacks of sagebrush photos from New Mexico, Arizona, Utah, and Montana. "There are a lot of varieties," admitted Luckey, "but I wanted the one I grew up with."

Besides distinctive sagebrush, another factor in the film's Western charm is its music. Luckey composed the short's song himself using a banjo, though in typically modest fashion he downplayed his musical skills. "I'm not a good banjo player," he said. "I know about three or four chords and can pick a tune in F." In fact, Luckey had studied banjo in the 1950s with Dick Roberts of The Banjo Kings.

He doesn't play the banjo on the soundtrack, but it's Luckey's voice that we hear. That was never Luckey's plan. The director feared that his voice was not professional enough for the finished product. Several more-accomplished singers were nearly engaged for the job, but they kept dying. Country singer Hoyt Axton was originally desired, but he passed away in 1999. Luckey then considered using the unique vocal stylings of country-and-bluegrass musician John Hartford. Unfortunately, he too passed away, in 2001. Finally, John Lasseter declared, "Bud, you're going to do it." Fortunately for all involved, Luckey ended the curse and was lucky enough to record his song in Nashville, Tennessee.

In 2004, the pastoral poetry of *Boundin'* debuted in front of the action-packed heroics of *The Incredibles*. In film after film, Pixar was showing its range. From the metaphysical gamesmanship of *Geri's Game* to the cockeyed wisdom of *Boundin'*, it seemed that there was no style or subject that a Pixar short film could not master. But the company's filmmakers had yet to tell a

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34	**Character Lineup:** *Boundin'*. Bud Luckey. Pencil. 11" x 17". 2003
35	**Character Lineup:** *One Man Band*. Ronnie del Carmen. Pencil & Photoshop. 11" x 17". 2003

story about people like themselves: artists, entertainers, those who clamor for the public's attention and want nothing more than to give pleasure to an audience. Now it was time to hear from them.

ONE MAN BAND

In a courtyard, in some faraway fantasy land, stands a one-man band, with kettle drum, cymbals, and horns. The court is empty, save for a little girl. She palms a gold coin, which glints in the sun, and she prepares to deposit her piece into a fountain. With a burst of energy, the musician serenades the young girl; she is tempted to surrender her treasure to the strolling player. Then another musician appears—scrawny, all elbows and angles, with a fool's cap on his head. He plays a succession of stringed instruments, to the little girl's delight. She is torn. A musical battle ensues.

Such is the story of *One Man Band*, Pixar's first short film to utilize two directors. Creators Mark Andrews and Andy Jimenez had worked together previously, on films such as *The Iron Giant* (1999) and *Spider-Man* (2003). They joined Pixar to work with Brad Bird on *The Incredibles*. Andrews was a story supervisor; Jimenez was director of photography and the artist in charge of building digital storyboards.

Brad Bird, who was the short's co-executive producer, explained the duo's working relationship: "Mark is about the force of an idea, and Andy is about bringing it onto the screen. . . . They love and hate each other, they drive each other crazy, and yet they both have huge respect for each other." Jimenez described the relationship in more colorful terms: "Mark is the crazy guy with a sword running down the hill, and I'm the guy sharpening his blade making sure the point is right."

Both Jimenez and Andrews had miserable experiences at other studios, where they had worked under dual directors who were unable to agree on a coherent vision for a film. So when Ed Catmull approached the pair about making a short for Pixar, they realized that they needed an idea they both believed in. Andrews recalled the beginning of their creative collaboration: "The first month was just figuring out what Andy and I like and identifying that gray zone where our ideas and tastes mix."

The two prospective directors presented three ideas at a studio pitch meeting. The first was about a pair of battling kings who go to violent lengths to please their spoiled babies; the second idea concerned a father who rediscovers a theme-park attraction with his son; and the third told the story of two dueling musicians. It was this third idea that John Lasseter instantly recognized as the perfect blend of Andrews's manic energy and Jimenez's sentimentality. *One Man Band* was born.

Unlike the case of *Boundin'*, in which an artist brought a fully developed idea, *One Man Band*, like most shorts at Pixar, underwent a gestation process before the filmmakers fully understood the characters and their motivations. In the earliest incarnation, the dueling street musicians—Treble and Bass—try to win the affection of a large crowd of people. "We established the stakes,"

explained Andrews, "but you still didn't know how to feel about what was happening because you didn't like either character."

In these early storyboards, Andrews kept cutting away to a drawing of a little girl. He found it easier to elicit reaction from one character rather than from a crowd—a filmmaking lesson he attributed to Hollywood director Frank Capra. It soon became obvious to the filmmakers that they should remove the crowd and focus on the interaction between the musicians and the girl.

Still, the motivations remained foggy. In a story meeting, Ed Catmull asked, "What's the little girl doing in there?" Answering his own question, he suggested that maybe she had come to throw a coin into the fountain. "It became clear that they're playing for this girl's *money*," said Andrews, "and it makes them despicable and totally likeable just like that."

With the story beats in place, Andrews and Jimenez created an animatic (a filmed reel that presents storyboard drawings along with the corresponding camera moves, music, and dialogue). The test screening for John Lasseter did not go well. The novice directors felt that their animatic fell flat because the music was just a random collection of songs, as opposed to something scored to the picture. To match the escalating actions of the musicians on screen, the directors needed to work with a composer. They solicited Michael Giacchino, who was about to score *The Incredibles*. He was intrigued by the possibilities of *One Man Band*: "Usually I don't get the film until it's completely finished, and this was a chance to actually be a part of the story." For the composer, this opportunity was "the coolest thing ever."

Another individual drafted early was Ronnie del Carmen, who served as *One Man Band*'s production designer. Like Andrews, del Carmen was a story supervisor at Pixar, but his versatility as a designer and draftsman allowed him to change hats. One of his primary tasks was to design the film's rustic village. The filmmakers wanted to set their story in a nonspecific setting—a fantasy world lost to time—so del Carmen incorporated bits of everything: Italian piazzas, Southwestern terra-cotta, and Tibetan architecture. The lighting of the village square was inspired by the unconventional and moody painting style of contemporary German artist Sowa.

"It's a credit to Ronnie's work that he created a timeless, placeless city, with a well-crafted collage of different styles," said Jimenez. With some amusement, he recounted that when the film screened in festivals in France, Germany, and Italy, every audience asked the directors whether *One Man Band* was based on a particular city in their country.

Another assignment of del Carmen's was the design of the little girl. Del Carmen nicknamed her Tippy, for obvious reasons. His instructions were modest: "All we said to him was that this girl has to be curious and break your heart," said Jimenez. Near the film's conclusion, however, the sweet little munchkin suddenly turns tough. When her valuable coin is lost in a sewer, she forcefully thrusts her hand toward the bumbling musicians and demands compensation. Del Carmen developed this moment with a character study composed of sequential drawings on a single page. When Jimenez and Andrews saw this piece, they knew that they had their character. The two directors exclaimed as one, "That! Just make that!"

Like the two competing musicians, Jimenez and Andrews had their share of disputes, some of which would take the form of a shouting match. Nonetheless, they were single-minded in their pursuit of a common goal: making a great film. Del Carmen was quick to credit the directors with their abilities to make decisions and not leave the crew waiting or wondering—the very experience that Andrews and Jimenez so disliked when working under a duopoly of directors. Del Carmen admired Andrews and Jimenez's decisive filmmaking style: "There's infinite possibilities of what you can do [in a CG film]; and if you honor all of those things, you won't do any of them. [Andrews and Jimenez

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36	**Tippy Character Study** (detail): *Ronnie del Carmen. Pencil & Digital. 11" x 17". 2003*
37	**Color Scripts:** *Lifted. Mark Holmes. Digital. 2005*

are] going on instinct. Even in uncertainty, they're going to choose [something], and then choose something else later, but they're going to make choices."

Since his background was in story, where the overall arc is most important, Andrews was somewhat bewildered by the myriad of options available to a director: "The other departments, like shading, modeling, lighting, rendering, and animation, need to know the finite details because that's all they deal with . . . down to the weave in the cloth or the wood grain on the violins or the reflection of the chrome and the brass on the horns. The nasal labial fold on the characters was a pain in the ass. You're just going, 'Are you kidding me?' Or is the string going to vibrate or not? How the hell do I know? It was insane."

Thankfully for Andrews, the rest of the Pixar crew turned the infinite choices into a range of manageable options. "Our tech supervisor, Bill Polson, saved our asses more times than not," Andrews admitted. "It boiled down to just telling them what we wanted, and they would go and hammer the hell on it and show us five different versions. Then it became easy, like a multiple-choice test."

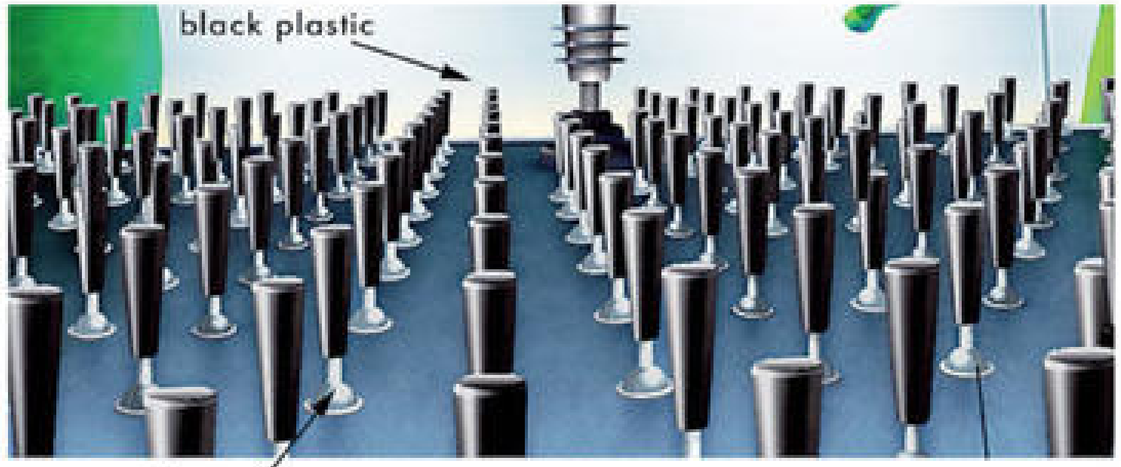
Despite the hiccups in story development and the array of options available to the first-time directors, Andrews and Jimenez played beautiful music together, and *One Man Band* was completed in record time for the studio's contemporary shorts—eight months.

LIFTED

In 2005, Gary Rydstrom, one of Hollywood's most respected sound designers, decided that it was time for a change of pace. The winner of an astonishing seven Academy Awards for his sound work on *Terminator 2: Judgment Day* (1991), *Jurassic Park* (1993), *Titanic* (1997), and *Saving Private Ryan* (1997), Rydstrom was ready for a new challenge—directing. "I got to my midlife-crisis era and wanted to do something more, or something different," Rydstrom told the *Portland Mercury* in 2007. "I'll always love sound, but sound comes at the end of the process. . . . I was yearning to get involved at the beginning."

Since Rydstrom had designed the sound for many Pixar shorts and features since the studio's first effort, *Luxo Jr.*, it was natural that he would bring the company his concept for *Lifted*: a blend of "driver's ed with alien abduction." The concept gained a coveted "green light." Rydstrom, who was not trained as an artist and hadn't animated since his film school days, was suddenly a director at Pixar.

Jeff Pidgeon's first storyboards for the film depicted two small, duplicate consoles—one each for the student, Stu, and the bloated instructor, Mr. B. (because you could never get an A). When John Lasseter saw these early boards, he said to Rydstrom, "What're you doing? Make it one big console, like the ones you use all day!" Stu, the film's protagonist, was thrust into a



situation with which Rydstrom could easily identify. The little green fellow would sit before a gigantic console with thousands of unidentified toggles, which no human—or alien—could possibly comprehend. "I was making a little short movie about what it's like to mix sound," Rydstrom realized, "where you do this technically difficult task with someone standing behind you and judging you all the time." In this way, Rydstrom's short took an unusual autobiographical turn.

Even though Rydstrom was inexperienced as a film director, he was undaunted by the prospect. Rydstrom initially pitched his project to Lasseter with only a few simple sketches. Thereafter, instead of expressing himself through drawings, as a typical animation director would, Rydstrom would discuss emotions, from cocky to panicked, that a character might experience. The Pixar artists would then translate those feelings into sketches. As the first non-animator to direct solo a Pixar film, Rydstrom summarized his role on *Lifted:* "My job directing it was to respond to people's drawings and say, 'I like that, I like that, I like that. . . .'"

Aiding this journey was designer Dan Lee, who helped visualize the characters early on. Rydstrom recalled that he "wanted the student alien to feel like a teenager," while the supervising alien was his "driver's ed instructor in high school, who was a very large man with a clipboard." After Lee produced the initial character concepts, Rydstrom initiated design-jam sessions with artists such as Teddy Newton, Ricky Nierva, and Bud Luckey. Mr. B. was largely designed by Jeff Pidgeon as a triangular mountain of alien flesh, with a tiny skullcap on top. All the designs were refined into their ultimate form by sculptor Greg Dykstra, who created maquettes of the characters, and by Jason Deamer, who produced the final drawings from which the digital models were built.

Just as Gary Rydstrom rose from sound designer to the director's chair, Mark Holmes was promoted to production designer—responsible for the look of the entire film. In this way, *Lifted* was fulfilling one of the missions of the Pixar shorts program: to create opportunities for studio veterans to move up the production ladder. Holmes had worked at Pixar in a variety of capacities since 1995, so he was accustomed to what he called the "production trenches," in which he was "working with a lot of known factors." There was always some supervisor to create expectations and set limitations. Suddenly, as production designer, he learned that there were "no visual boundaries" except the ones dictated by the story. Holmes was happy to be pushed from his comfort zone and found the *Lifted* assignment to be more satisfying than anything he had done before. He felt a greater sense of ownership in the finished product.

Holmes quickly realized that *Lifted* was a story about contrast. "It was about [the] juxtaposition of a serious moment of abduction with a comedic moment of taking a driver's training test," he said. Such juxtapositions made themselves felt in the film's design: the "contrast between the interior of the bedroom and the exterior of the house, between the bedroom when it's just moonlit versus when the [spaceship] beam is on." Inside the spaceship itself, there is the striking contrast between futuristic technology and more mundane elements, such as rolling office chairs and a clipboard.

The visual influences on *Lifted* obviously include films by George Lucas and Steven Spielberg from the 1970s and 1980s. At a crew party, Rydstrom compelled his collaborators to watch Spielberg's *Close Encounters of the Third Kind* (1977). But there is an irony to the design of *Lifted*. Rydstrom insisted that he did not want a "cool spaceship"; rather, it was meant to be "a

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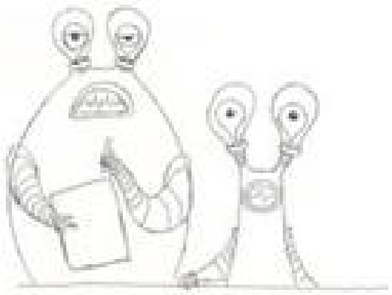
38	**Ship Console Model Sheet:** *Lifted*, Mark Holmes, Digital, 2007
39	(top left) **Stu Concept Art** (detail): *Lifted*, Bud Luckey, Pencil, 8½" x 11"
	(bottom left) **Mr. B. Concept Art**: Dan Lee, Pastel, 2004
	(top right) **Concept Art**: *Lifted*, Dan Lee, Pen, 11" x 17", 2007



utilitarian spaceship that's going to get banged around a lot" by student alien drivers taking it out for the very first time. Holmes and Rydstrom envisioned a bland, industrial-strength aesthetic for the spaceship's interior. To achieve this look, they studied photos of dental offices and the Department of Motor Vehicles.

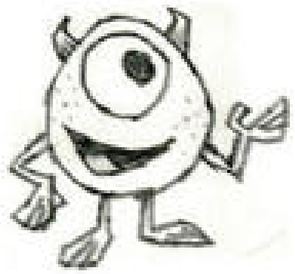
The designs for the characters themselves took inspiration from a quirky array of sources. "At our very first crew party we had two food items," Rydstrom recollected: Mallomar cookies, which were supposed to influence the shape of the spacecraft, and green Jell-O, a model for the aliens. As he later put it, "I wanted a character that could stretch his face and go from one wild expression to the other, which is why we ended up with this gelatinous, liquid Prell kind of thing." The director gave Holmes a bottle of green hair gel and asked that the aliens be made of a similarly translucent material, with bubbles floating inside. Holmes, however, felt that the first look was too CG; it lacked the organic sophistication that communicated the idea of living, breathing creatures. What was even more troublesome, the translucent look made the characters' expressions difficult to read.

Holmes searched for a more satisfactory surface treatment for the two aliens. He and character designer Jason Deamer created a series of paintings and drawings that gave the characters a more opaque center with translucency on the edges. Holmes felt that problems still remained: "We realized the shader technology that we'd set up to this point was not quite robust enough to give us the new look." So the crew had to build a new program, which achieved nearly 90 percent of what they desired but was exceedingly slow. According to Holmes, "it was so rendering-intensive that it was actually impractical to use." Technical supervisor Bill Polson rewrote the program yet again to make it faster and more efficient. Throughout the process, Holmes expected the most from himself and his fellow technicians: "There was so much nuance that I wanted in terms of how it reflected light, how much transparency it had, where the transparency was, having sub-layers of skin, of how the bubbles inside the material responded to light." Such a sentiment typified the level of care and attention that went into even a five-minute film such as this one.

At the completion of Gary Rydstrom's first film for Pixar, he admitted, with some surprise, that the hardest part of the process was creating the sound design, the very profession for which he won so many Oscars. "Everything else was such a joy, and working with the artists was so great; but then it came to my part, the sound, and it was really hard." Now as director and sound designer in one, he could not turn to his director and ask, "Hey, do you like it?" So when needing counsel, Rydstrom would show something to John Lasseter. As Rydstrom recalled, "He always said, 'More subwoofer.'"

Nonetheless, producing the sound for *Lifted* offered the first-time director some pleasure: "As a sound guy, I love when sound tells you part of the story that you can't see." When the hapless human character is thrust into a tree, the image remains frozen; and the sound takes over. The audience hears the loud crunching of the sleeping human dragged through gnarled branches by the spaceship's powerful tractor beam. Rydstrom was delighted: "If I had my way, I'd hold on the static shot of the tree for hours and just hear crunching." Like other animation directors before him, he found that implying violence could be more effective than actually showing it on screen. "Maybe it's more brutal that way," he suggested.

Finally, unlike the student driver from another world, Gary Rydstrom passed his test. He graduated from making a short to gaining the chance to direct an animated feature for Pixar. *Lifted* passed the test as well, with audiences and as evidence that short films are the perfect training ground for the designers and directors of tomorrow.



FEATURE FILM–BASED SHORTS

Beginning with the release of *Mike's New Car* in 2002, a new breed of Pixar animated shorts appeared: films starring characters from the features. Unlike the shorts produced for theatrical distribution, these films were designed to supplement the DVD releases of their respective feature films. The idea of creating such elaborate bonuses for the benefit of DVD buyers stemmed from the Pixar philosophy: "Don't just deliver, overdeliver."

There is a pragmatic element at work as well. The feature-based shorts avoid one of the greatest challenges in any CG film: to create a character from scratch. By the end of a feature production, the models are built and each animator is truly the master of the characters he or she worked on. The animator knows how the character moves, how it thinks, how it might react in any situation. So it makes perfect sense to employ those animators and their fully developed characters in a little cinematic coda. Bill Cone, a production designer on *Cars*, compared the feature-based short to the dessert at the end of a meal.

The shorts also served as an ideal training ground for first-time directors. Dan Scanlon, who codirected *Mater and the Ghostlight* with John Lasseter, felt that it was hard to mess up the film because "everybody knows what they're doing so well that the boat kind of steers itself." There is less likelihood that a novice captain could crash the ship.

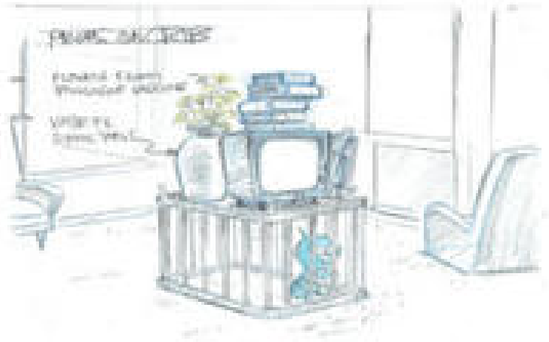
MIKE'S NEW CAR

Pete Docter, who was assigned the task of directing the studio's first feature-inspired short, *Mike's New Car*, was happy to jump on the project. Various ideas for a *Monsters, Inc.*–related short were suggested, including an idea about Mike and Celia's wedding, styled to feel like it was shot by a hand-held video camera. Eventually, Docter remembered a series of sketches that he had produced years earlier for a proposed animated short about a guy contending with various gadgets in his car. The humor was broad and physical, rather like a "locked-down-camera shot, a Laurel-and-Hardy–type thing," recalled Docter.

The short film's codirector, Roger Gould, felt that this simple concept played to Docter's strengths: "Pete is at the core a great observational animator of personality and character." There would be no elaborate sets, slick camera moves, or tour-de-force effects. Gould continued, "It's really about getting to enjoy Mike and Sulley's personalities and their relationship . . . the simple joy of bringing animated characters to life."

A short film allows its director to experiment with ideas that might seem too risky for a feature. In the case of *Mike's New Car*, Docter was able to play with the timing in a way that would have been difficult in *Monsters, Inc.* He cited the scene in which Sulley plays with the mechanical seat adjustment. When the storyboards went into animation, the director told the scene's animator, John Kahrs, "Double the length. The longer it goes, the funnier it is." Thus, the timing of the scene fluctuated in a way that would have been unusual in a feature. "You'll hand out a scene," Docter explained, "and it may grow by frames here and there but it's more or less what you time out in layout." On *Mike's New Car*, the process was looser. "It was almost like improv comedy," Docter said.

While the feature's biggest technical challenge was creating the tools to animate fur so that Sulley could be a shaggy, friendly monster, by the time the short went into production, the tool was debugged and robust. Gould remembers, "Every time I asked the effects animator, Patrick James, whether Sulley's fur could do something it was always a quick, 'Sure.' 'Can we turn on the air conditioner and blast his fur with air?' 'Sure.' 'Can his fur react as we whip him back and forth on his seat flopping to the ground and smashing him against the windshield?' 'Sure.' It really allowed the animation to be pushed to the limit."



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40	(top) **Title Design** (detail): *Mike's New Car*, Geefwee Boedoe, Mixed Media, 6" x 5½", 2002
	(bottom) **Car Model Packet** (detail): *Mike's New Car*, Gary Schultz, Pencil, 17" x 11", 2002
41	(left) **Crib Model Sheet**: *Jack-Jack Attack*, Nelson Bohol, Pencil, 11" x 17", 2004
	(right) **Storyboard** (detail): *Jack-Jack Attack*, Teddy Newton, Pencil & Marker, 9¼" x 5", 2004

When *Mike's New Car* was included in the *Monsters, Inc.* DVD, the short was well received by fans. *Monsters, Inc.* became the fastest-selling DVD title up to that time, selling seven million units in its first week on the market.

JACK-JACK ATTACK

In contrast to *Mike's New Car*, the concept for *Jack-Jack Attack* had originally been planned as part of *The Incredibles* itself. Writer/Director Brad Bird recalled, "I had originally imagined that storyline with the babysitter as a running gag I could cut away to if the main action got too slow or the plot machinations became too complicated. But once we started getting the film up on reels, I discovered the story had enough momentum without it and that it was actually a distraction to cut away to the baby-sitter scenes."

The storyline of the well-intentioned babysitter, Kari, minding little Jack-Jack, Mr. and Mrs. Incredible's baby boy, and losing him to Syndrome remains in the final film, but the gags between the setup and the payoff were cut. When it came time to produce a bonus short for the DVD, it seemed natural to resurrect those sequences. They are quite funny and seem like outtakes, to which DVD buyers have grown accustomed. In the completed short, Jack-Jack frightens Kari with his emerging superhuman powers and wrecks the house in the process. The short is simple and self-contained, like a classic, gag-driven Hollywood cartoon.

Teddy Newton, a story artist and character designer on *The Incredibles*, was responsible for many of the film's outlandish gags. Some of his original concepts were even wilder, including Jack-Jack walking through a plate-glass window and fighting raccoons in the backyard over hard-boiled eggs. Newton explained his logic: "There is something funny about something very fragile being placed in dangerous situations. That's what makes it scary: a baby being in constant danger." Ultimately, the filmmakers decided that Jack-Jack could not engage in any behavior that could be imitated by real children. The assumption was that actual infants will not float through walls or shoot laser beams out of their eyes so those heightened gags remain in the film.

Unlike the robustness of the Sulley and Mike models at the end of production on *Monsters, Inc.*, Kari and Jack-Jack were two minor characters who didn't do much "acting" in the feature. In fact, Kari is only seen briefly in the feature, from the chest up, as she talks on the phone to Mrs. Parr. To upgrade Kari into a fully performing character her proportions had to be designed, her lower body built (starting off of Violet's legs) and dressed with pants and sneakers custom built for the short. Jack-Jack, who in the feature is wearing footed terry cloth pajamas while Kari speaks to Mrs. Parr on the phone, changed into his diaper on the very next cut in the short to avoid the complications of simulating the cloth of the more complicated costume.

For an artist such as Lou Romano, the production designer on *The Incredibles*, working on *Jack-Jack Attack* was something of a holiday. Many of the designs had been completed for the feature. "We already had the living room, kitchen, and dining room set. . . . There was only one new set, which was the bathroom." Bryn Imagire, the shading art director on both *The Incredibles* and *Jack-Jack Attack*, recalled that the production of the short went by "really fast, and we were all really tired."

MATER AND THE GHOSTLIGHT

Despite the fact that many elements are already in place, directing a feature-based short can still be unnerving. Dan Scanlon was a first-time director when he began work on *Mater and the Ghostlight*, the short that was included on the *Cars* DVD. "There's so much choice. It's absolutely terrifying," Scanlon said about the challenges that a director faces. "There's a lantern that needed to be made for the film. [Choosing] what kind of lantern and its color is enough for me. But then it got into what kind of

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42	**Title Design:** *Mater and the Ghostlight*, Bud Luckey, 8½" x 11", 2006
43	**Film Still:** *Mater and the Ghostlight*, 2006

gouges do you want on it? Do you want scrapes? Tiny scrapes? Scratches? Dents? What kind of dents? How old is the lamp? And you just think, 'I don't know. Just take a lantern, throw it down the stairs, and tell me what it looks like.'"

The story for *Mater and the Ghostlight* was inspired by a tale that Lasseter and his *Cars* codirector Joe Ranft heard during a research trip on Route 66. As they absorbed the Americana of the open road and the forgotten small towns of yesteryear, they stopped in the southeast corner of Kansas. There they encountered a group called the Kansas Historic Route 66 Association. One member, Dean Walker, was noted for his ability to turn his feet backward. Sitting with the curious filmmakers in the Eisler Bros. store, Walker mentioned a phenomenon known as the "spook light," or "ghost light." Late at night, on one particular stretch of Route 66, a glowing orb of light was known to appear, float around, and enter into passing cars. Thrill-seekers went hunting for the mysterious light source, but no one had been able to identify or unmask it. Ultimately, it remained a legend.

While finishing work on *Cars*, Ranft produced a few drawings of Mater, the rusty tow truck, getting frightened by a ghost light. Ranft and Lasseter agreed that it would make a great short film. They drew inspiration from the Don Knotts comedy *The Ghost and Mr. Chicken* (1966). In this case, however, it would be Mater, with the voice of Larry the Cable Guy, in the Don Knotts role.

The legend of the ghost light is briefly mentioned in *Cars*, but it would be more fully developed in the short. *Mater and the Ghostlight* was originally to be directed by Ranft and Scanlon, who had worked together on the feature's story team. Scanlon had never directed before, and he recalled with fondness how Ranft nudged him into the director's chair: "I think he knew that this was kind of a fun experience for me to get to direct." Since Ranft was busy at the time with other responsibilities, Scanlon proceeded with the writing and then would gently remind his codirector, "You know, Joe, I'm kind of writing a lot of this stuff." Ranft would suddenly pretend to be incredibly distracted and say, "Hey, if you don't mind doing it. . . ." So Scanlon started storyboarding. Then Ranft would say, "You do the first half, and I'll do the second half." Of course, by the time Scanlon finished his half, Ranft, like a proud parent, would suggest, "Well, you're doing a really good job. Do you just want to do the rest?" In this way, Ranft eased his younger colleague into a role of greater responsibility. Scanlon emphasized that Ranft was a major contributor to the short, and recalled fondly the opportunity of moving from a student-mentor relationship with Ranft to directing a film alongside him.

But tragedy struck. In summer 2005, Joe Ranft died in a car accident. Pixar lost one of its most distinctive voices, and Lasseter lost one of his earliest collaborators. When *Cars* was released that summer, the film was dedicated to the memory of Joe Ranft.

The loss also left an opening in one of the directors chairs on *Mater and the Ghostlight*. Quietly, Lasseter assumed his late friend's duties. He and Scanlon finished the film. It was an uncanny moment of coming full circle. Twenty years after his first directing credit, Lasseter was making another short film. In those two decades, Pixar went from a startup computer company built around a group of nerds with a dream to a multi-billion-dollar brand synonymous with family entertainment. In the years that separate *Luxo Jr.* and *Mater and the Ghostlight*, Pixar had come a long way.

EARLY SHORTS

THE ADVENTURES OF ANDRÉ & WALLY B.

LUXO JR.

RED'S DREAM

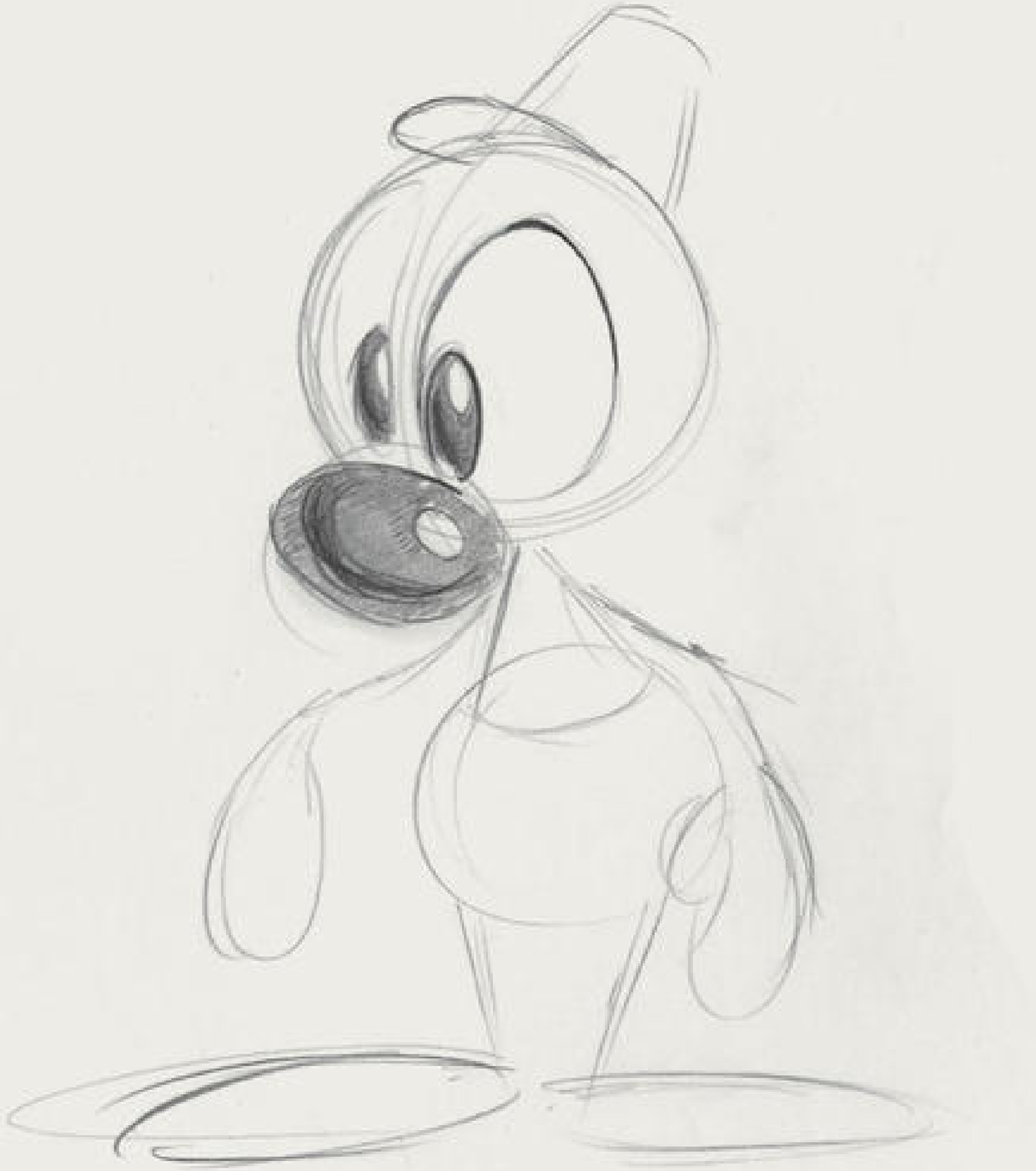
TIN TOY

KNICK KNACK

John Lasseter 1984

THE ADVENTURES OF ANDRÉ & WALLY B.

RELEASE DATE	1984
RUNNING TIME	1 minute 50 seconds
WRITER	John Lasseter & Alvy Ray Smith
DIRECTOR	Alvy Ray Smith



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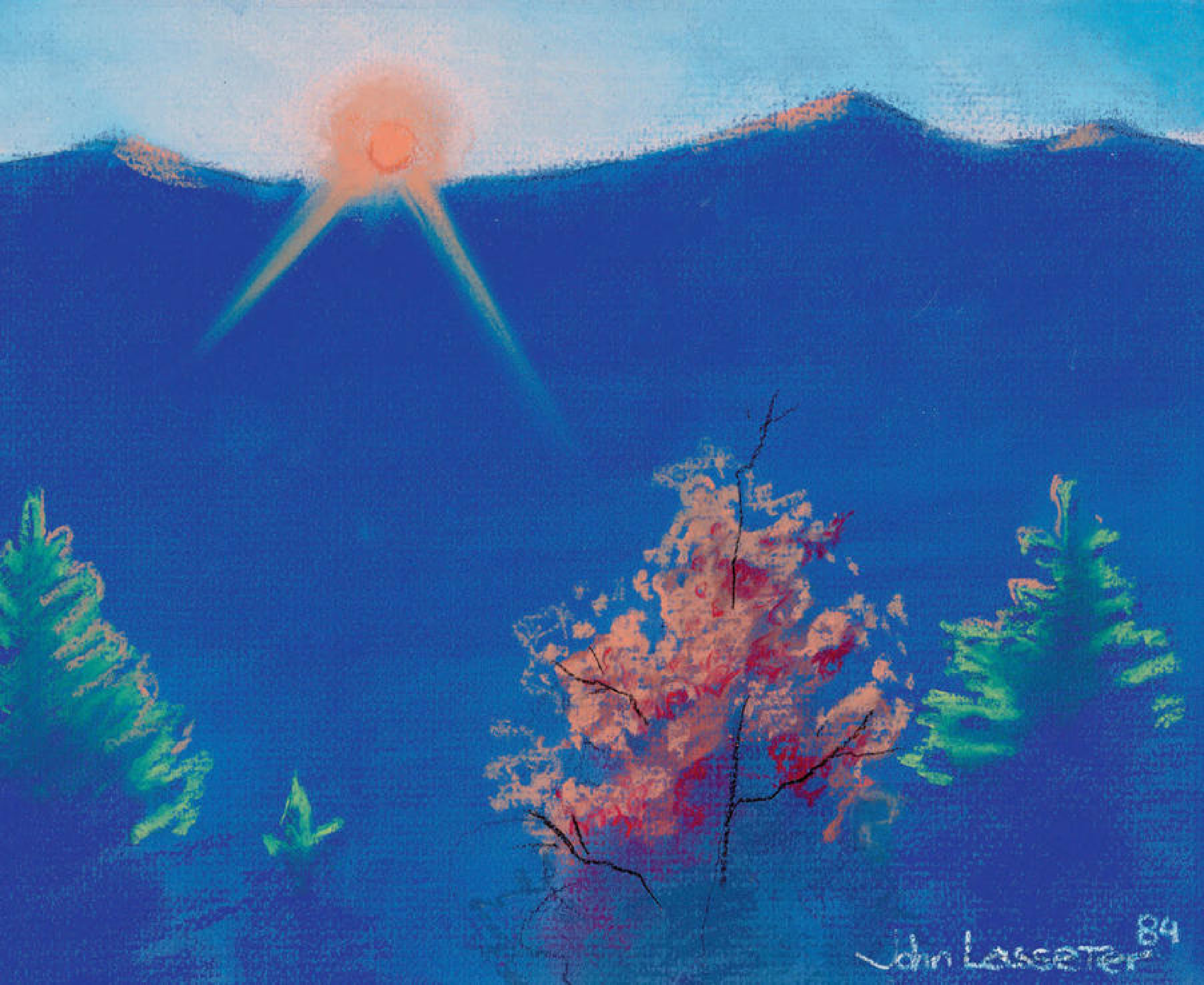
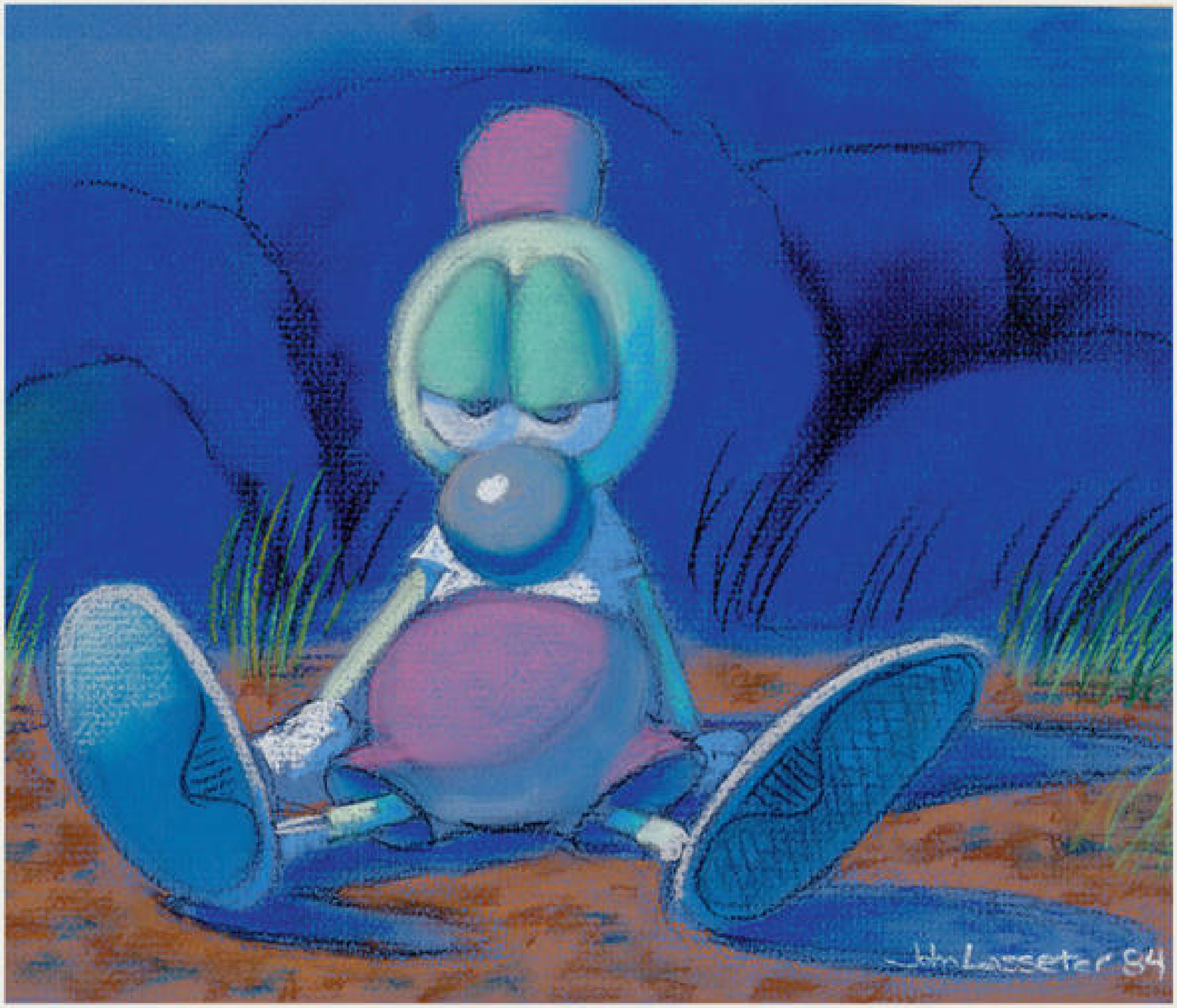
45	**Wally B. Concept Art**, John Lasseter, Pastel, 12" x 10", 1984
46	**André Concept Art**, John Lasseter, Pencil, 8½" x 11", 1984
47	(left) **André Concept Art** (detail), John Lasseter, Pencil, 8½" x 11", 1984
	(right) **André Concept Art**, John Lasseter, Pencil, 8½" x 11", 1984


John Lasseter 84



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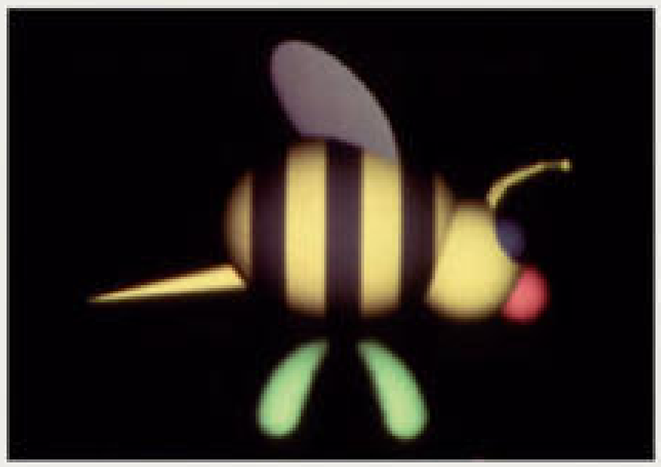
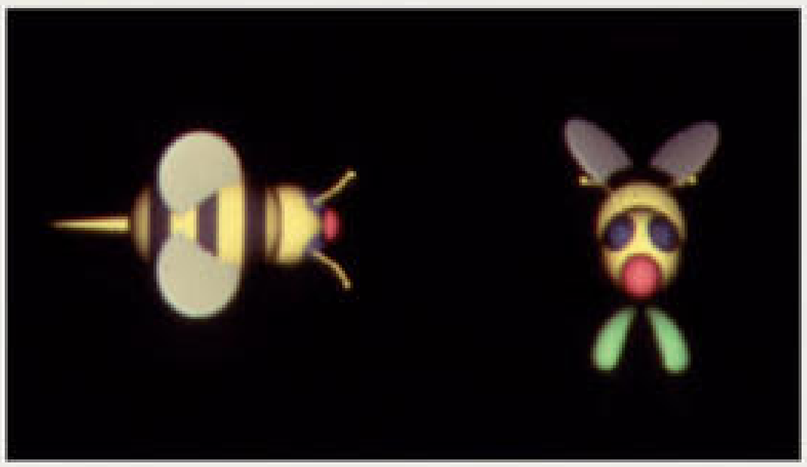
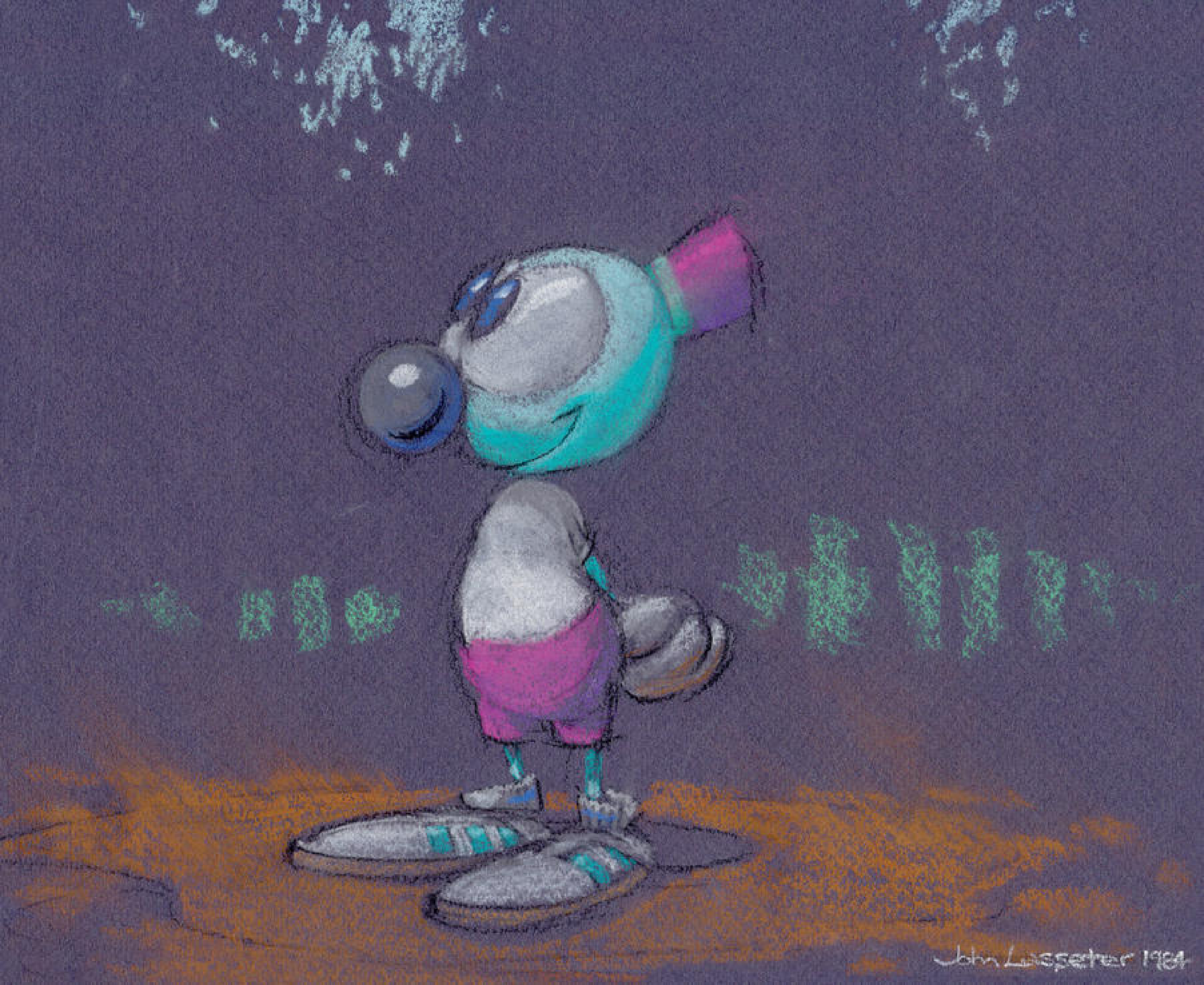
48	**Concept Art**. John Lasseter. Pastel. 13" x 10". 1984
49	**Concept Art**. John Lasseter. Pastel. 13" x 10". 1984



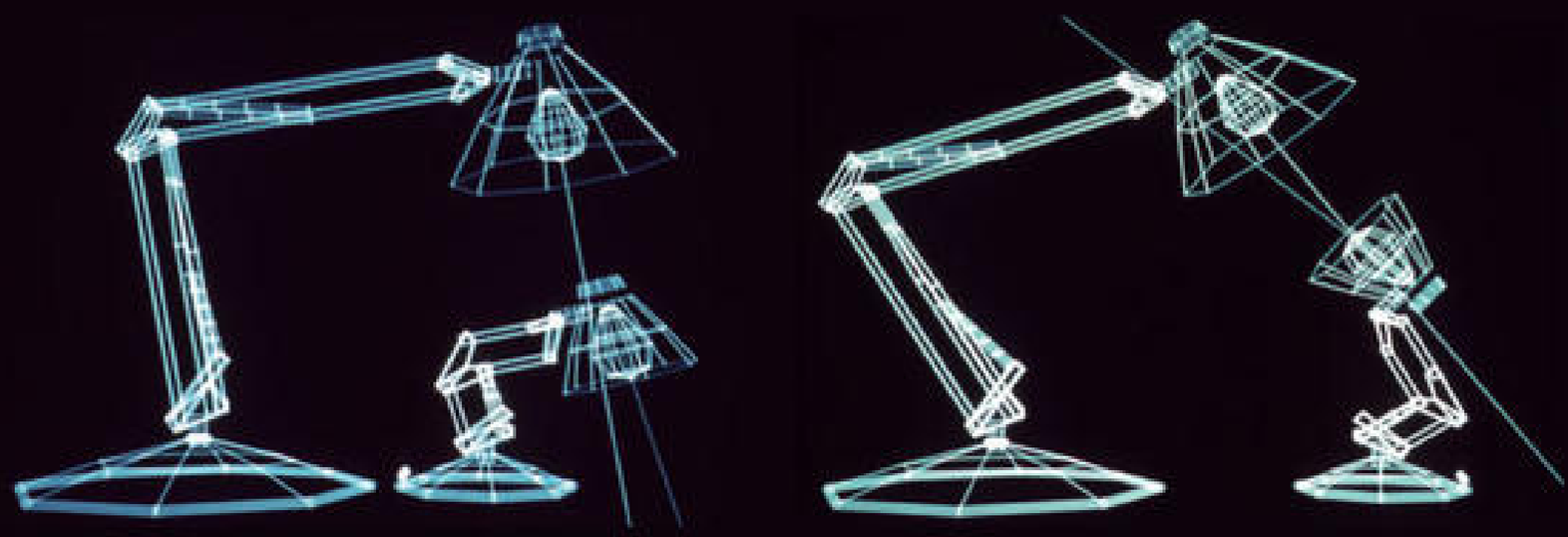


page	
50	(top) **Concept Art**, John Lasseter, Pencil, 8½" x 11", 1984
50	(bottom) **Wally B. Test Render**, Eben Ostby, Bill Reeves, Alvy Ray Smith, 1984
51	**Concept Art**, John Lasseter, Pastel, 13" x 10", 1984
52	**Tree Test Renders** *(building up the forest)*, Bill Reeves, Digital, 1984
53	**Film Still**, 1984

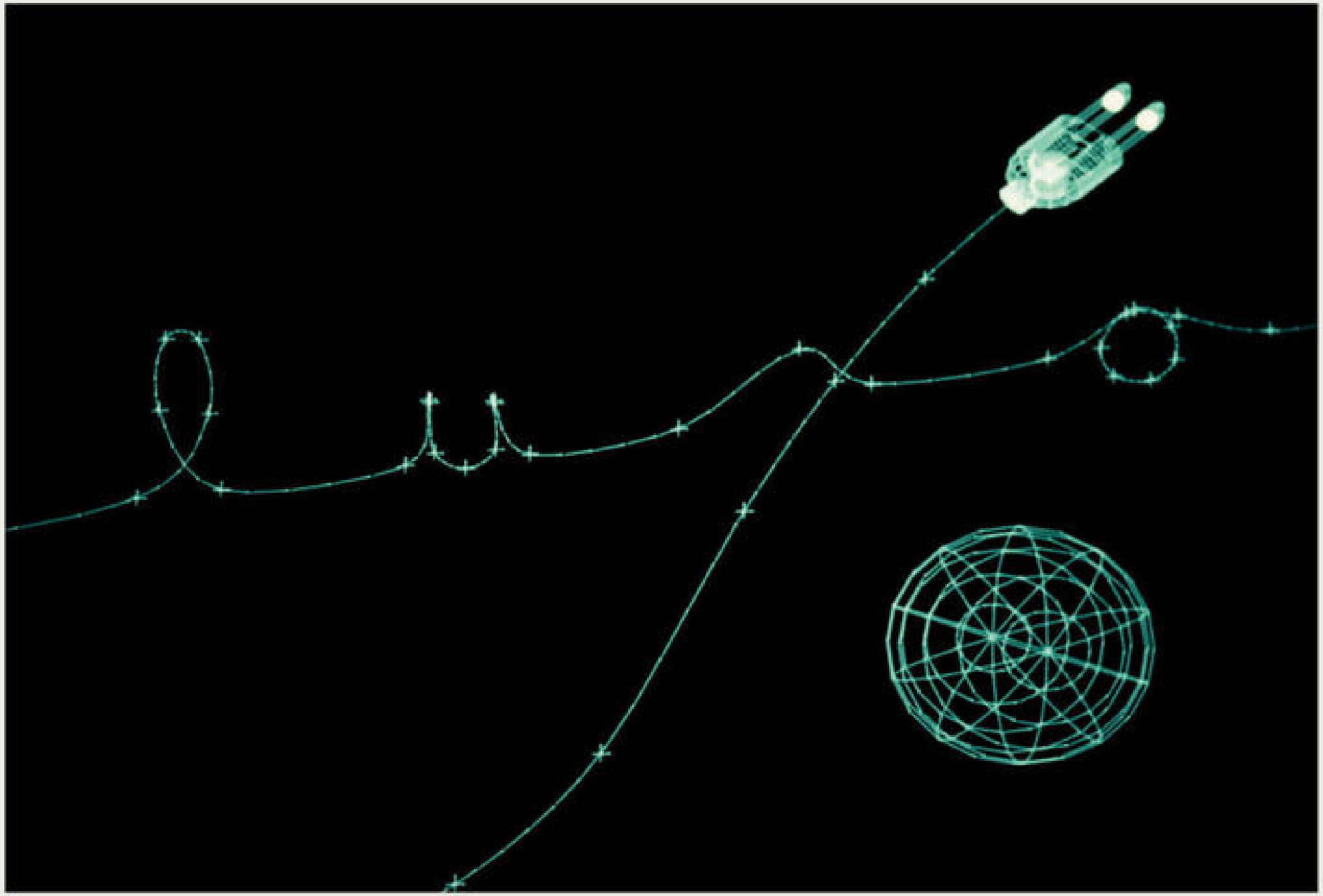

John Lasseter 1984

LUXO JR.

RELEASE DATE	1986
RUNNING TIME	2 minutes 10 seconds
WRITER	John Lasseter
DIRECTOR	John Lasseter



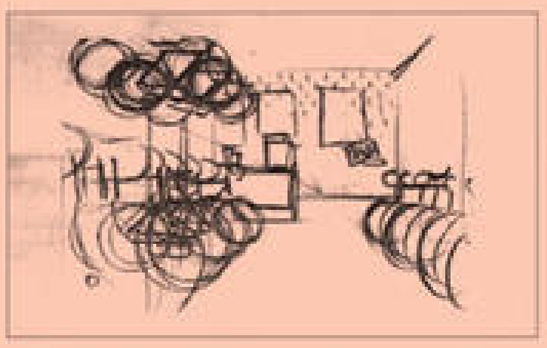
J. Lasseter 1986

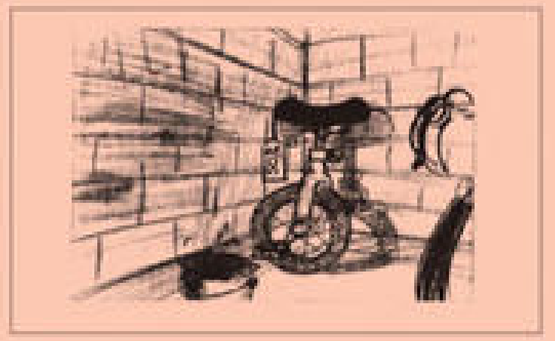


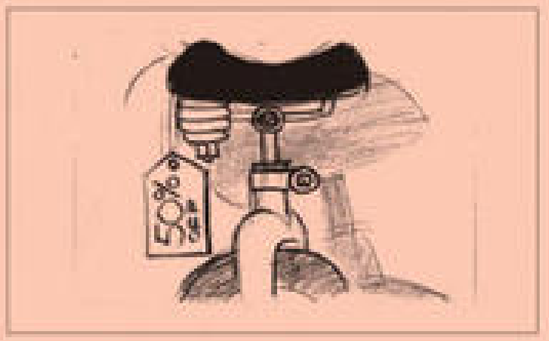
page	
54	**Wire Frames**, John Lasseter, Eben Ostby, Digital, 1986
55	**Concept Art**, John Lasseter, Pastel, 13" x 10", 1986
56	**Wire Frame**, John Lasseter, Eben Ostby, Digital,1986
57	**Film Still**, 1986

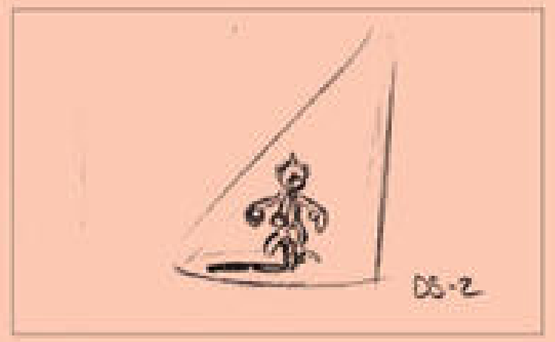
RED'S DREAM

RELEASE DATE	1987
RUNNING TIME	4 minutes 10 seconds
WRITER	John Lasseter
DIRECTOR	John Lasseter



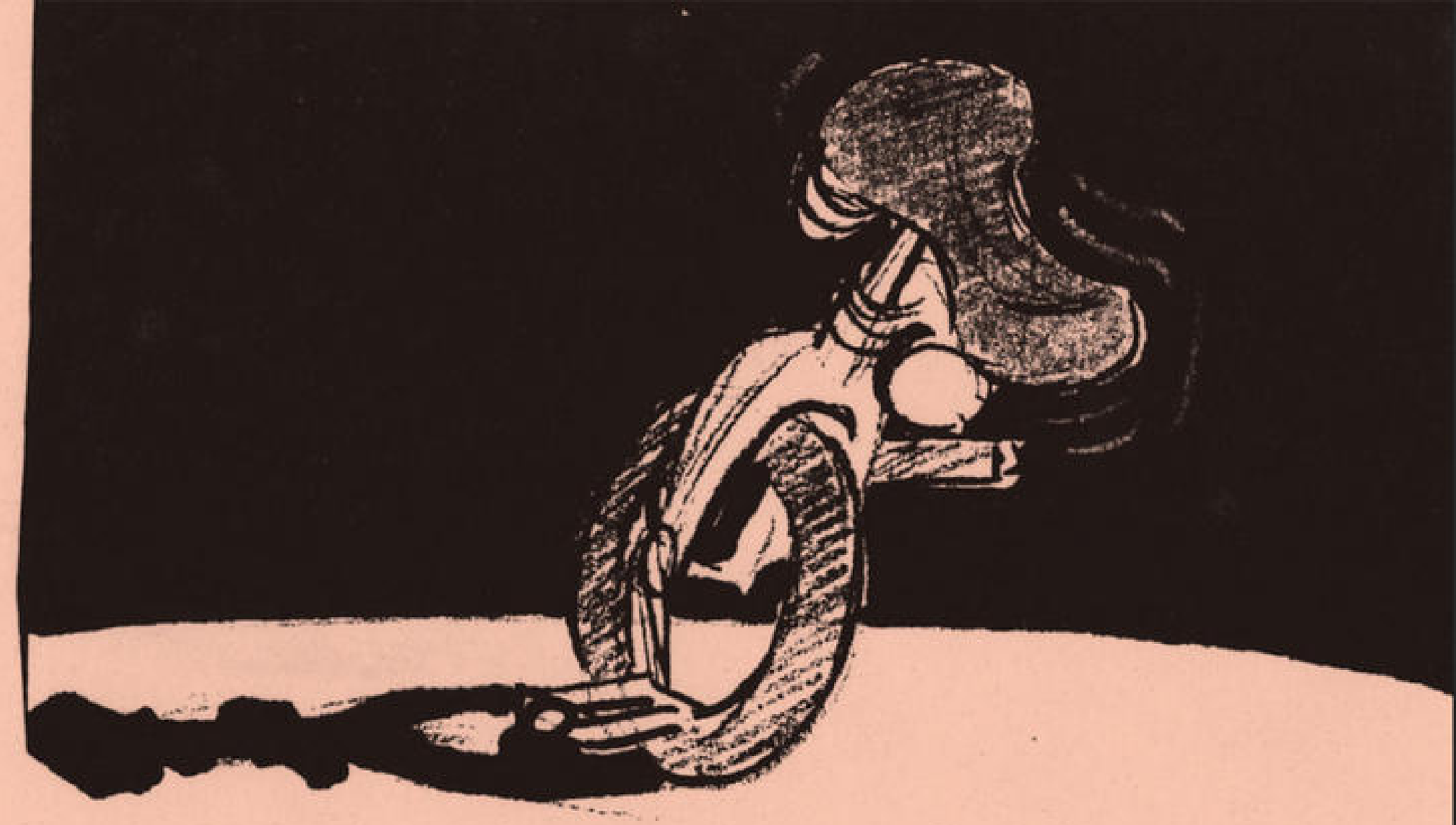






PAGE	
58	**Storyboards** (detail), John Lasseter. Pen & Marker. 8½" x 11", 1987
59	**Storyboards** (detail), John Lasseter. Pencil & Marker. 8½" x 11", 1987

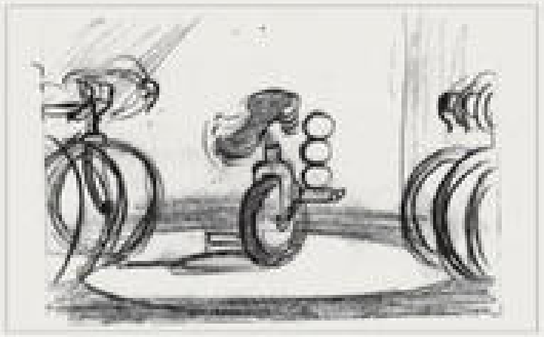
Company Co

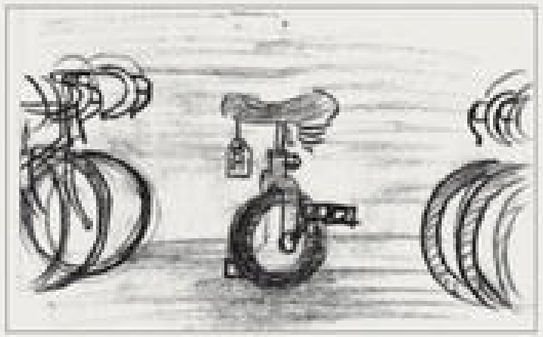


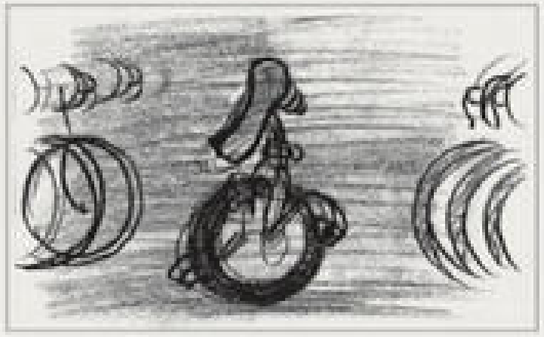
DESCRIPTION: CROWD CHEERS, RED TAKES BOWS.

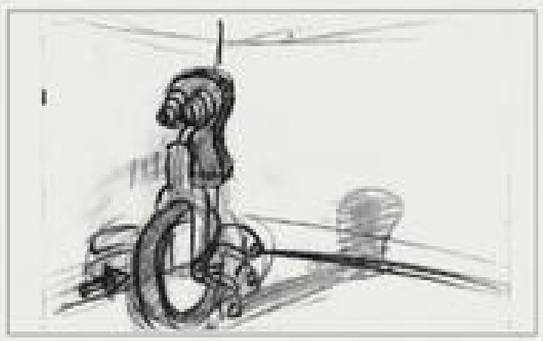
NOTES:

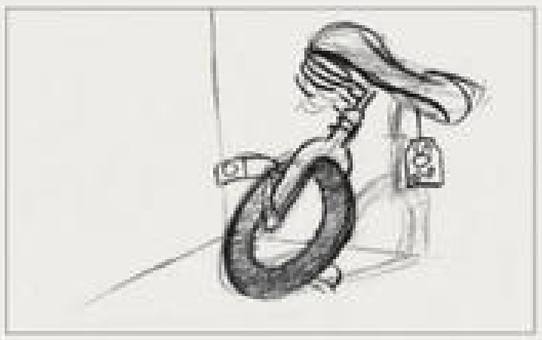
ELEMENTS	DATE:





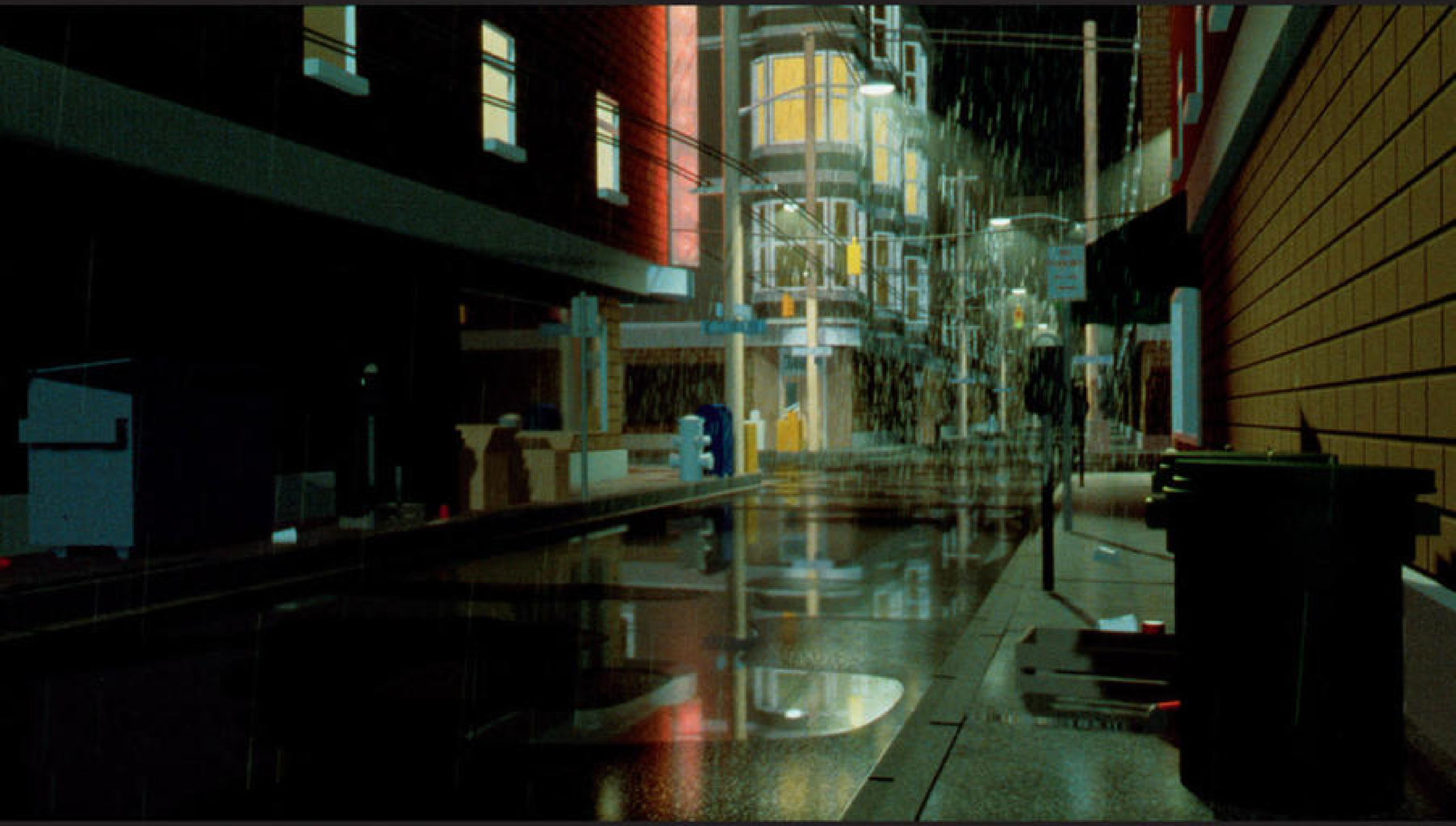






page	
60	**Storyboard** (detail), John Lasseter, Pencil, Pen & Marker, 8½" x 11", 1987
61	**Storyboards** (detail), John Lasseter, Pencil & Pen, 8½" x 11", 1987

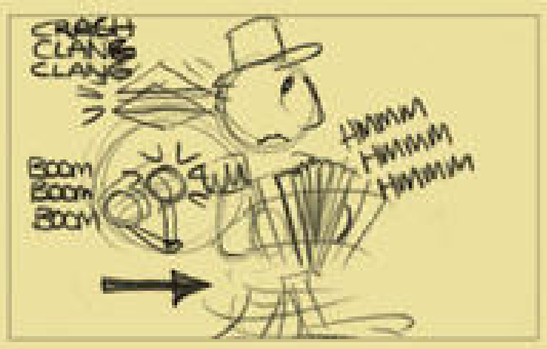
page	
62	**Film Still**, 1987
63	**Film Still**, 1987

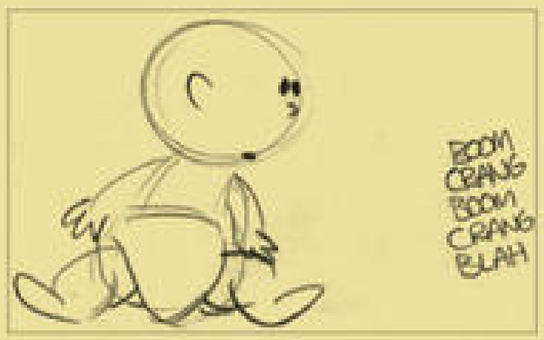


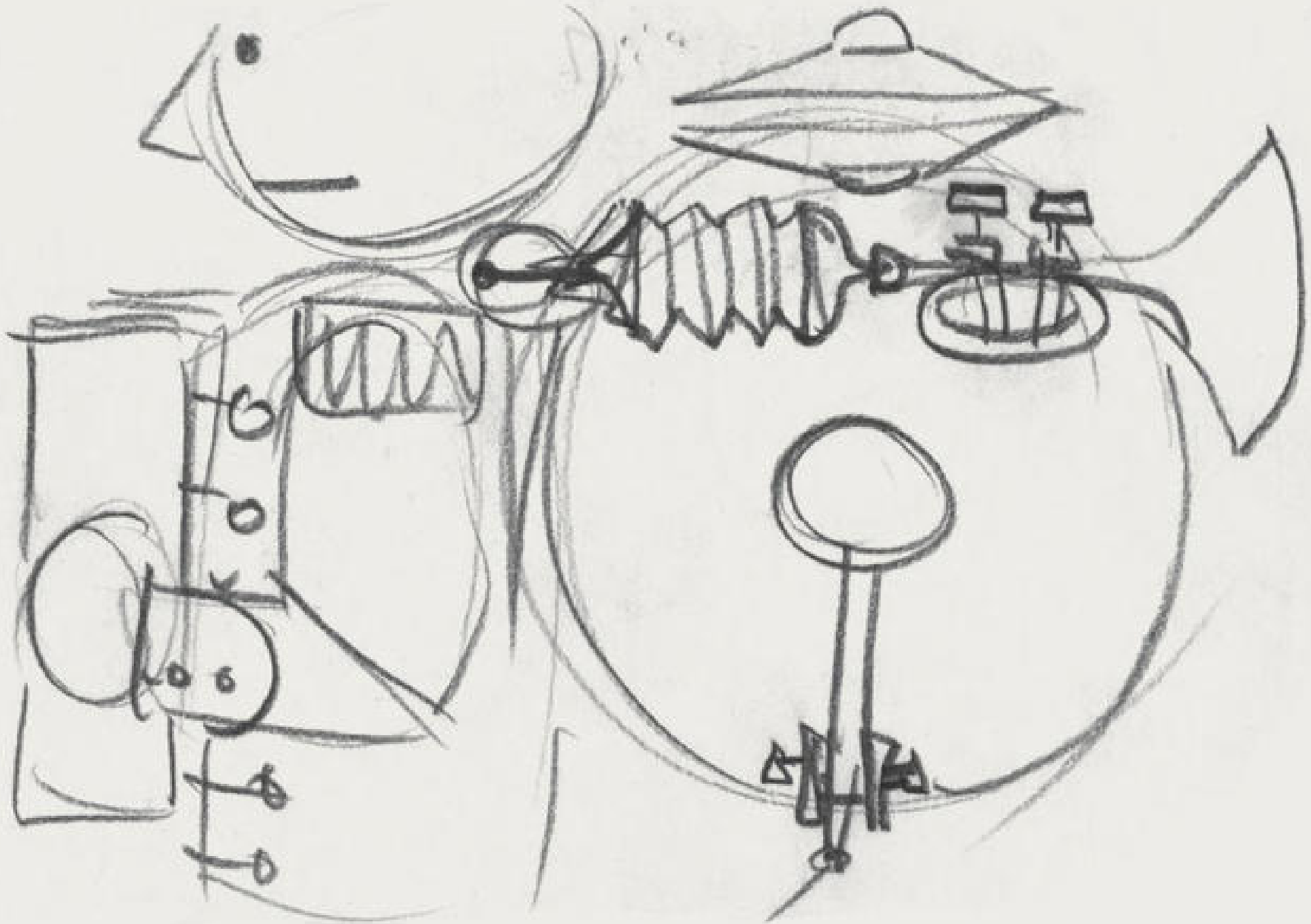
SALE
Clearance

TIN TOY

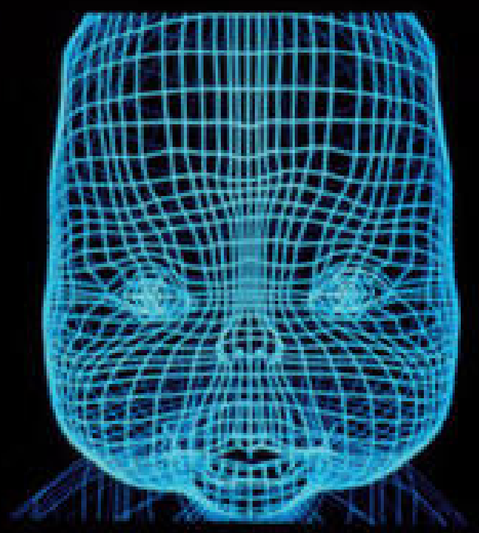
RELEASE DATE	1988
RUNNING TIME	5 minutes 10 seconds
WRITER	John Lasseter
DIRECTOR	John Lasseter







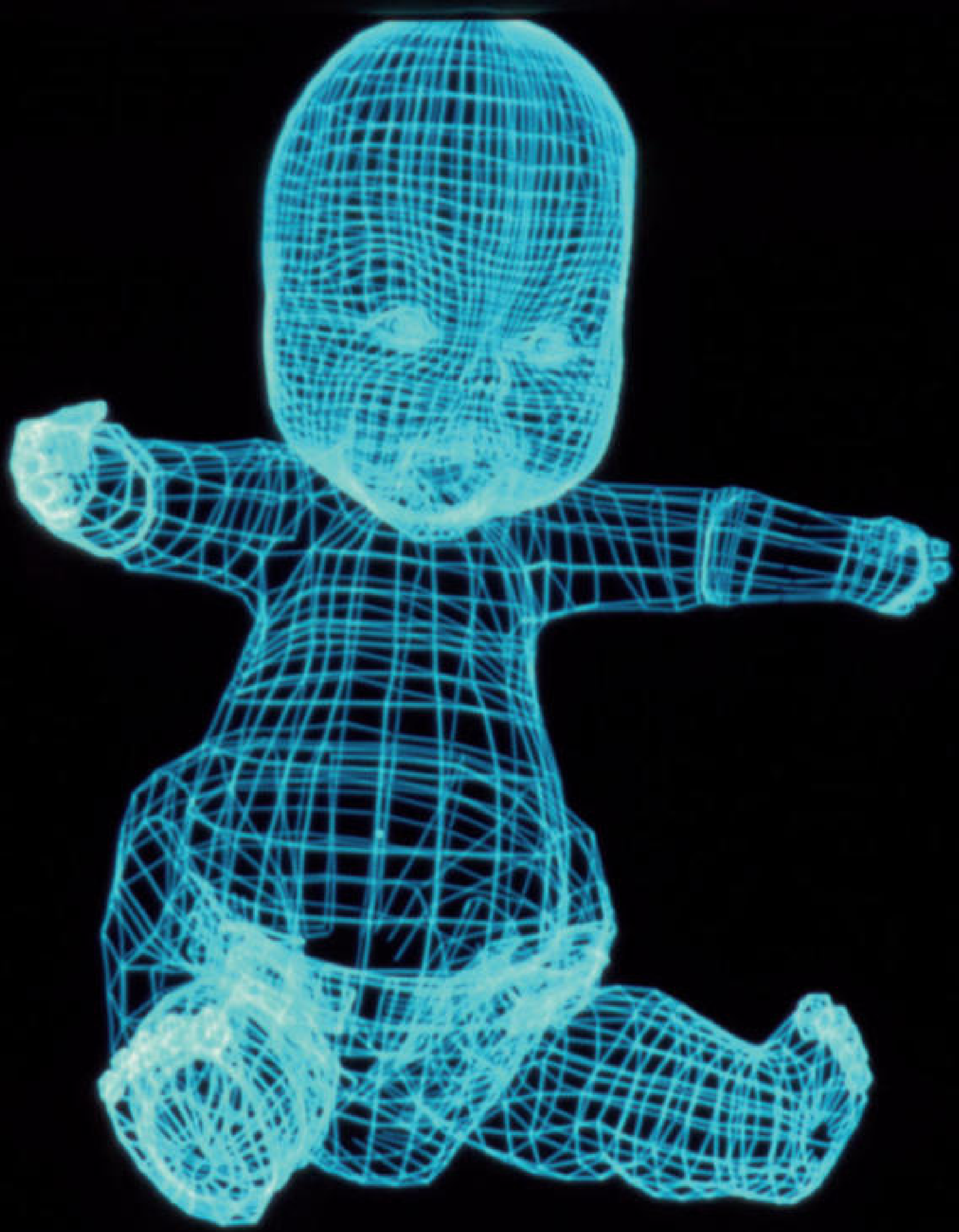
page	
64	**Storyboards**, John Lasseter, Pencil, 5½" x 4", 1987
65	**Storyboard** (detail), John Lasseter, Pencil, 5½" x 4", 1987



Apr 15 1988 body.1.0.pic

Mar 14 1988 junk.1.0.pic

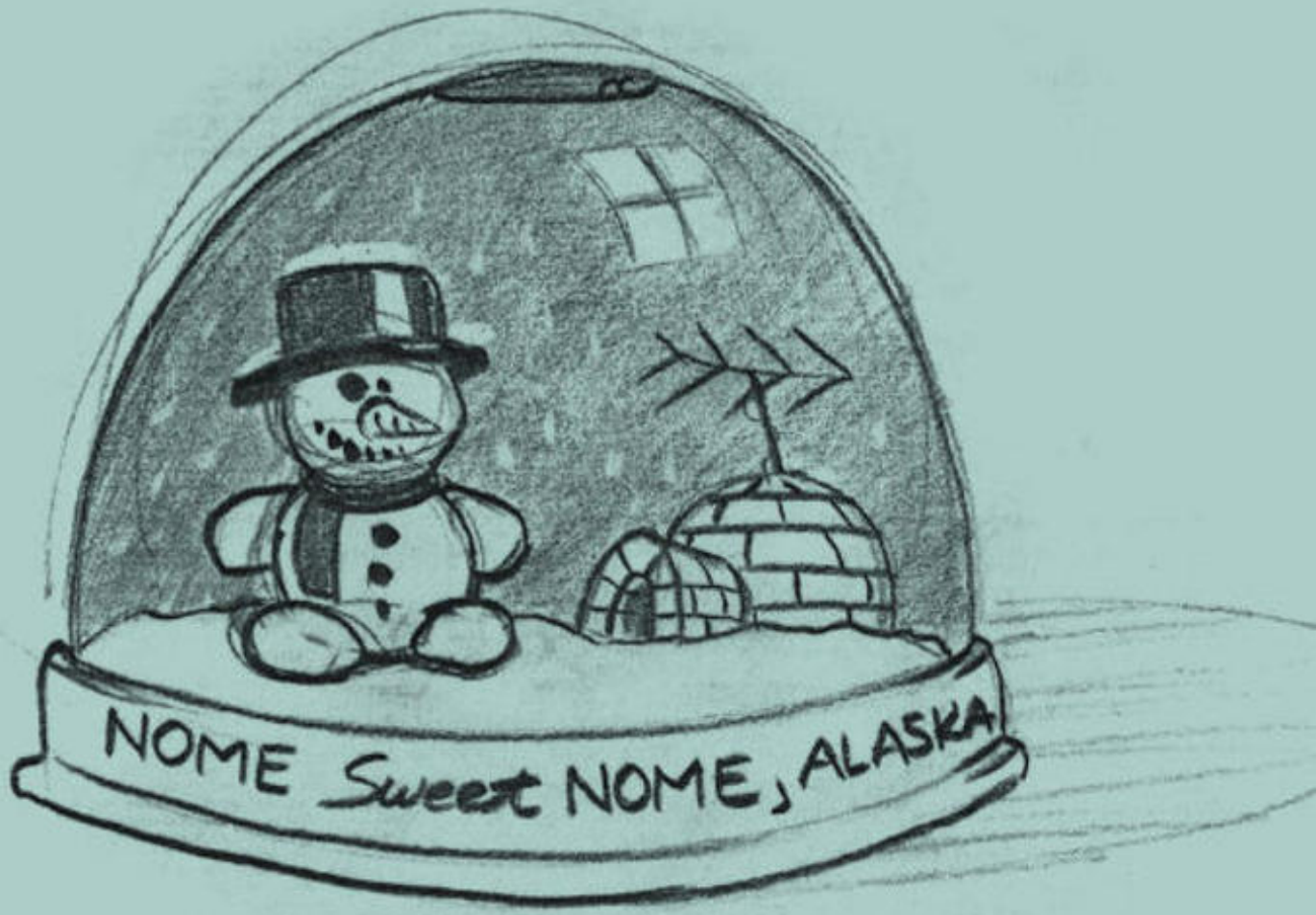
PAGE	
66	(top left) **Wire Frame**, Bill Reeves, Digital, 1987
	(middle and bottom left) **Unshaded Surface Render**, Bill Reeves, Digital, 1987
	(right) **Test Render**, John Lasseter, Bill Reeves, Digital, 1987
67	**Film Stills**, 1988
68	**Wire Frame**, Bill Reeves, Digital, 1987
69	**Film Still**, 1988



TIN TOY

KNICK KNACK

RELEASE DATE	1989
RUNNING TIME	3 minutes 35 seconds
WRITER	John Lasseter
DIRECTOR	John Lasseter

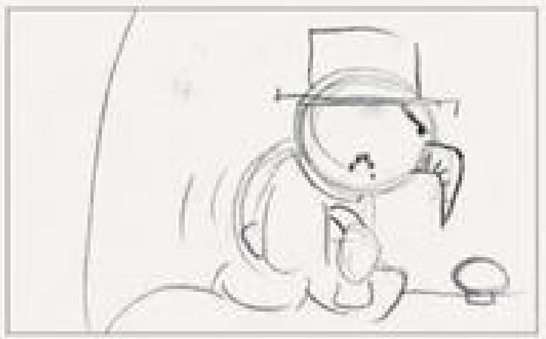


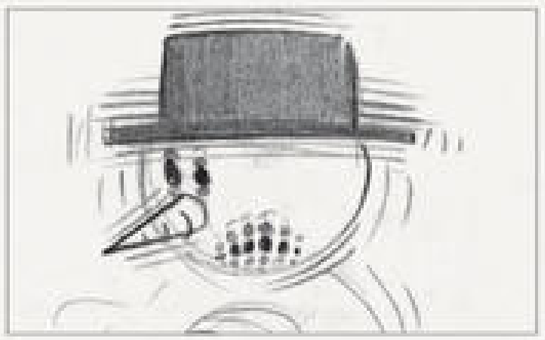
PAGE	
70	**Storyboard** (detail), John Lasseter. Pencil, 5½" x 4", 1989
71	**Storyboard** (details): Pyramid, Yael Milo; Tree 1, Tony Apodaca; Flamingo, Eben Ostby; Skeleton, Flip Phillips; Girl, Craig Good; Pencil, 5½" x 4", 1989

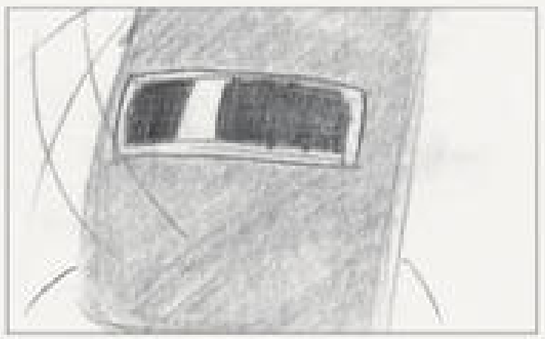
NY MIAMI

NOTIONS
"COME
HERE"

WHAM
WHAM
WHAM
RAA







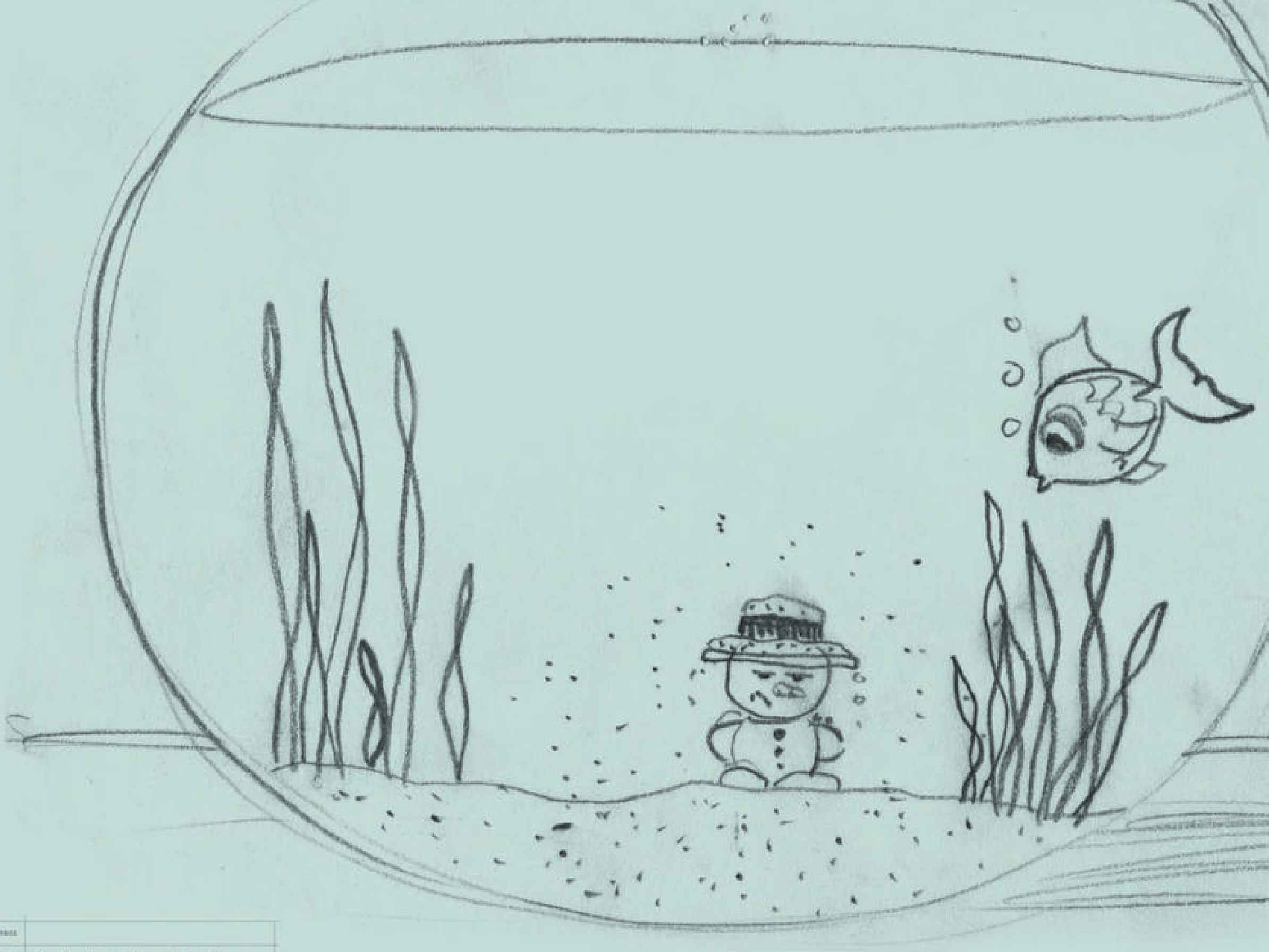
HISS
HISS
CLICK
CLICK
CLICK
CLICK

CLICK
CLICK
POOF

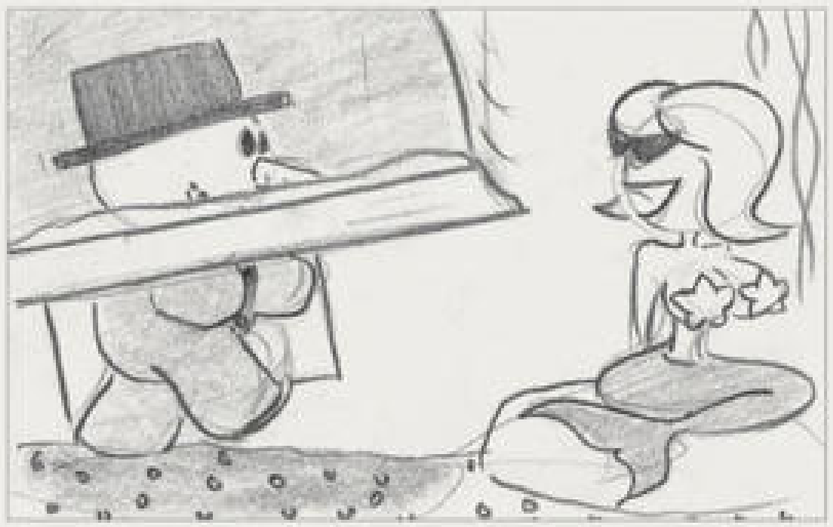
TNT
CLICK
CLICK
CLICK

CLICK

BOOM



PAGE	
72	**Storyboards**, John Lasseter, Pencil, 5½" x 4", 1989
73	**Storyboard** (detail), John Lasseter, Pencil, 5½" x 4", 1989



PAGE	
74	**Storyboards**, John Lasseter, Pencil, 5½" x 4", 1989
75	**Film Stills (mermaid design before and after)**, 1989

ATLANTIS

THE NEXT GENERATION OF SHORTS

Geri's Game

For the Birds

Boundin'

One Man Band

Lifted

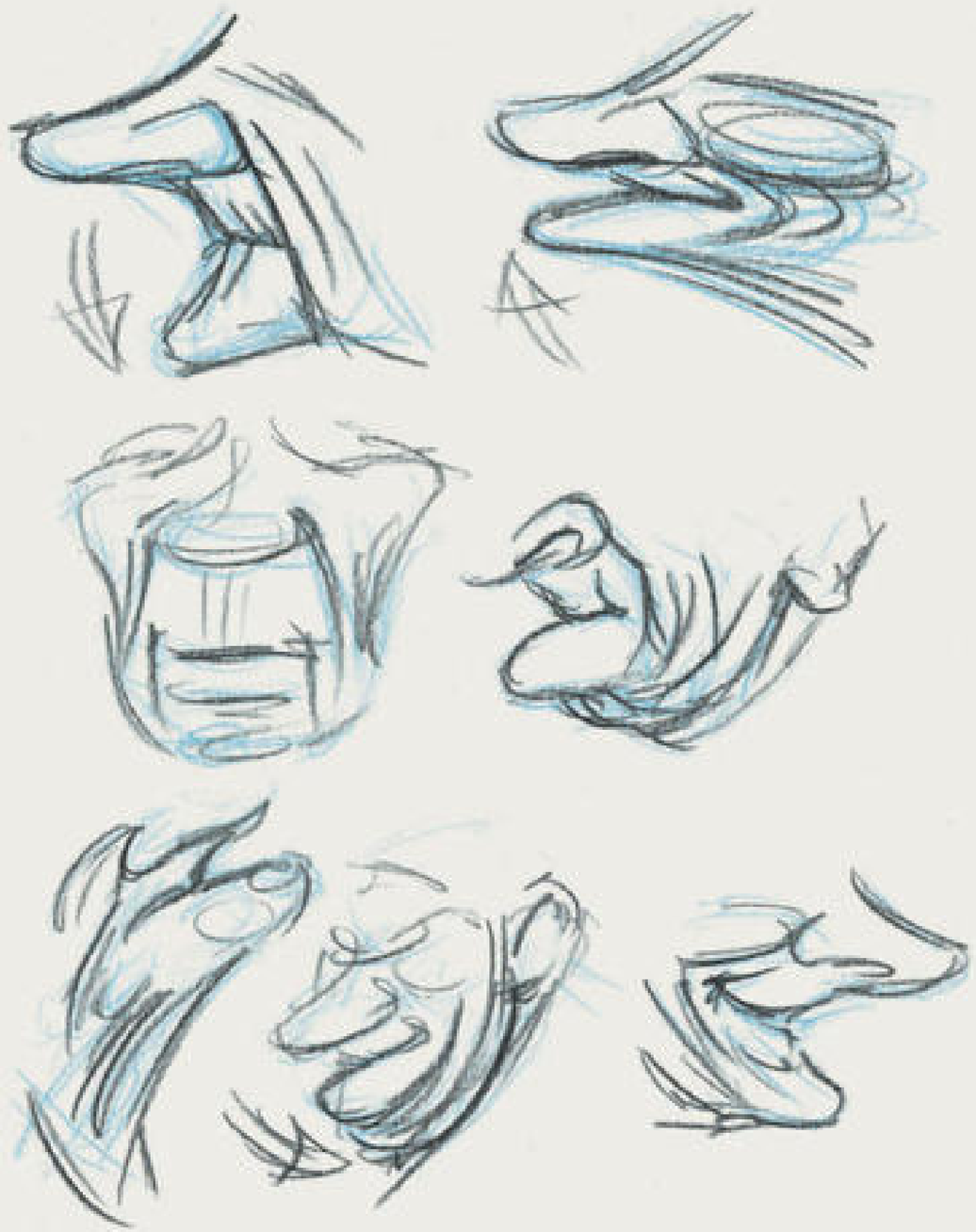
O.K.
BUD WILKINS
2003

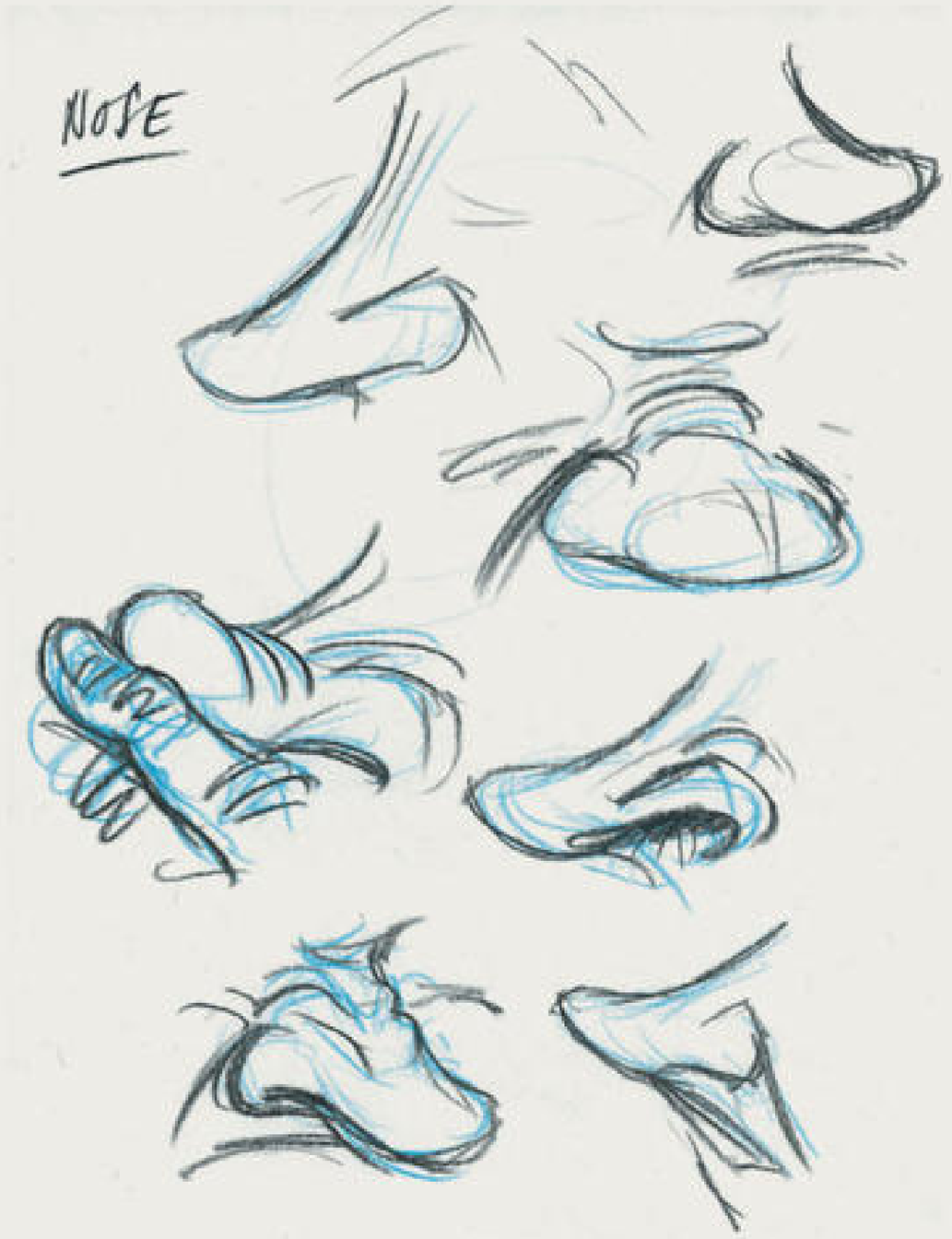
GERI'S GAME

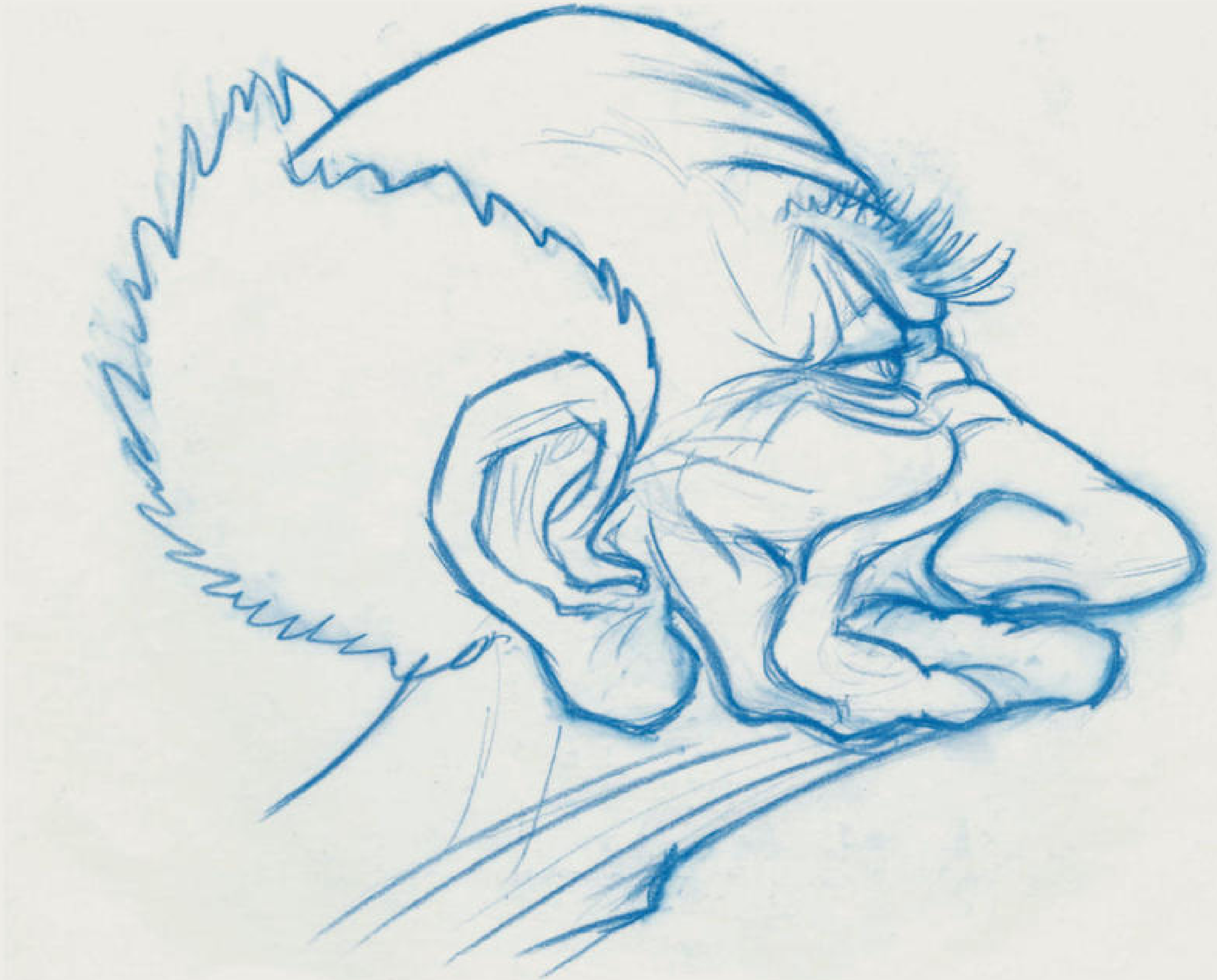
RELEASE DATE	1998
RUNNING TIME	4 minutes 50 seconds
WRITER	Jan Pinkava
DIRECTOR	Jan Pinkava

PAGE	
77	**Concept Art: Boundin'**, Bud Luckey, Pencil, 11" x 17", 2002
78	(left) **Character Sketch**, Bob Peterson, Pen, 8½" x 11", 1997
78	(right) **Storyboard** (detail), Jan Pinkava, Pencil, 8½" x 5½", 1997
79	**Concept Art**, Jan Pinkava, Crayon, 8½" x 11", 1997

PAGE	
80, 81	(top) **Concept Art** (details). Jan Pinkava. Pencil, 8½" x 11", 1997
	(bottom) **Concept Art** (details). Jan Pinkava. Pencil, 8½" x 11", 1997
82	**Geri's Eyes Concept Art.** Jan Pinkava. Pencil, 8½" x 11", 1997
83	**Geri's Chin and Nose Concept Art.** Jan Pinkava. Pencil, 8½" x 11", 1997




NOSE



PAGE	
84	**Concept Art,** Jan Pinkava. Pencil. 12½" x 10½", 1997
85	**Concept Art,** Jan Pinkava. Pencil. 12½" x 10½", 1997

GERI - NECK
1/08/97

FWD/BACK (LOW) NECK ROTATION AS IF ROOTED AT FRONT & BACK AT BASE OF NECK

ADAM'S APPLE

GULP
- moves up the neck more than down.

CAN THIS BE MOVING UNDER NECK SKIN?

GERI - NECK
1/22/97

UPPER NECK BEND (where head/skull meets neck) CENTRED SOMEWHERE IN HERE

(Skin will wrinkle when head is lowered)

Compression at back of neck

BUT

this will probably not be very visible in the film

STRETCHING & COMPRESSION MOSTLY HERE (between adam's apple and chin)

ADAM'S APPLE MOVES ONLY SLIGHTLY DURING SIMPLE BEND

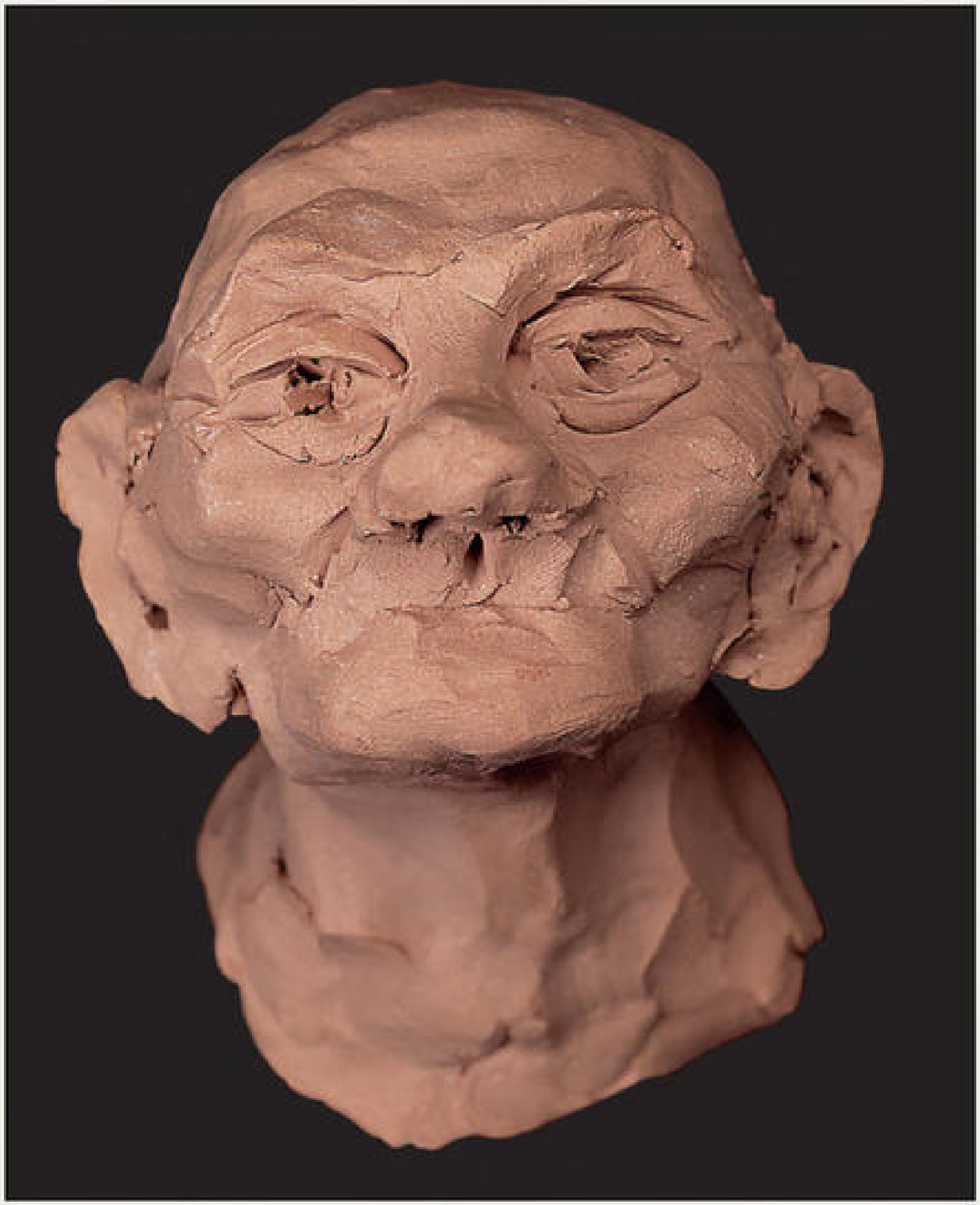
GERI - INSIDE OF MOUTH concept
1/23/97

MOUTH LINING

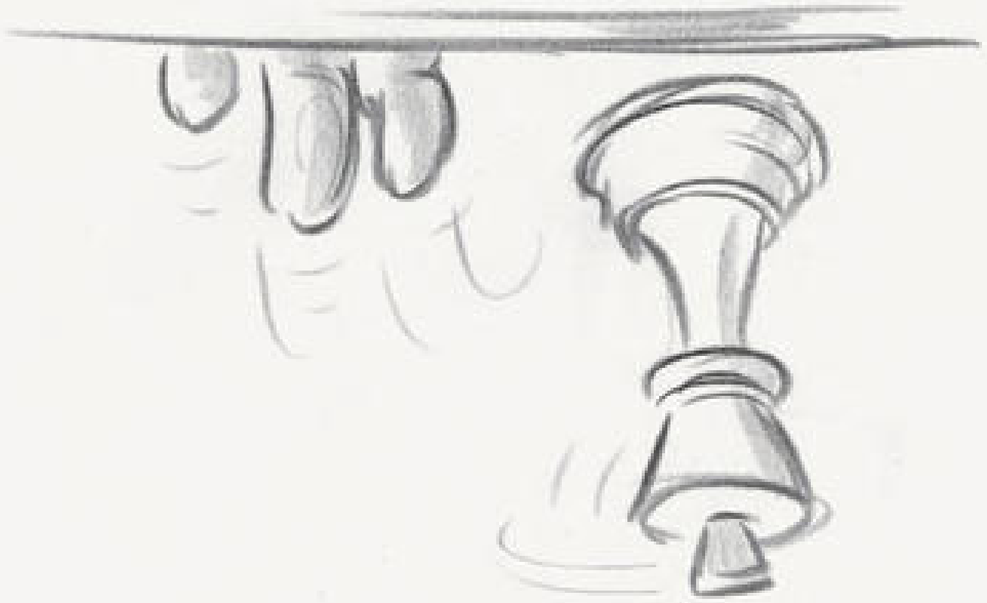
TONGUE

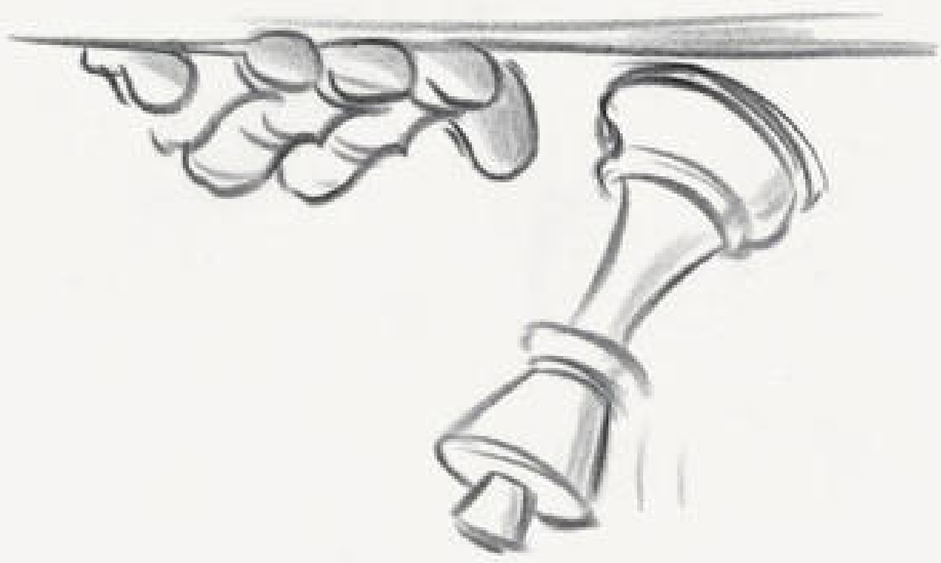
"GUMS"

Tongue may show, AND gums in v. wide smile



PAGE	
86	(top left) **Geri's Neck**, Jan Pinkava, Pencil, 8½" x 11", 1997
	(top right) **Geri's Adam's Apple**, Jan Pinkava, Pencil, 8½" x 11", 1997
	(bottom left) **Geri's Neck**, Jan Pinkava, Pencil, 8½" x 11", 1997
	(bottom right) **Geri's Mouth**, Jan Pinkava, Pencil, 8½" x 11", 1997
87	**Geri's Head Rough Clay Sculpt**, Jan Pinkava, Clay, 4½" x 3⅛" x 3¾", 1997
88	(top) **Storyboards**, Jan Pinkava, Pencil, 8½" x 5½", 1997
	(bottom) **Storyboards** (detail), Jan Pinkava, Pencil, 8½" x 5½", 1997
89	**Film Still**, 1997

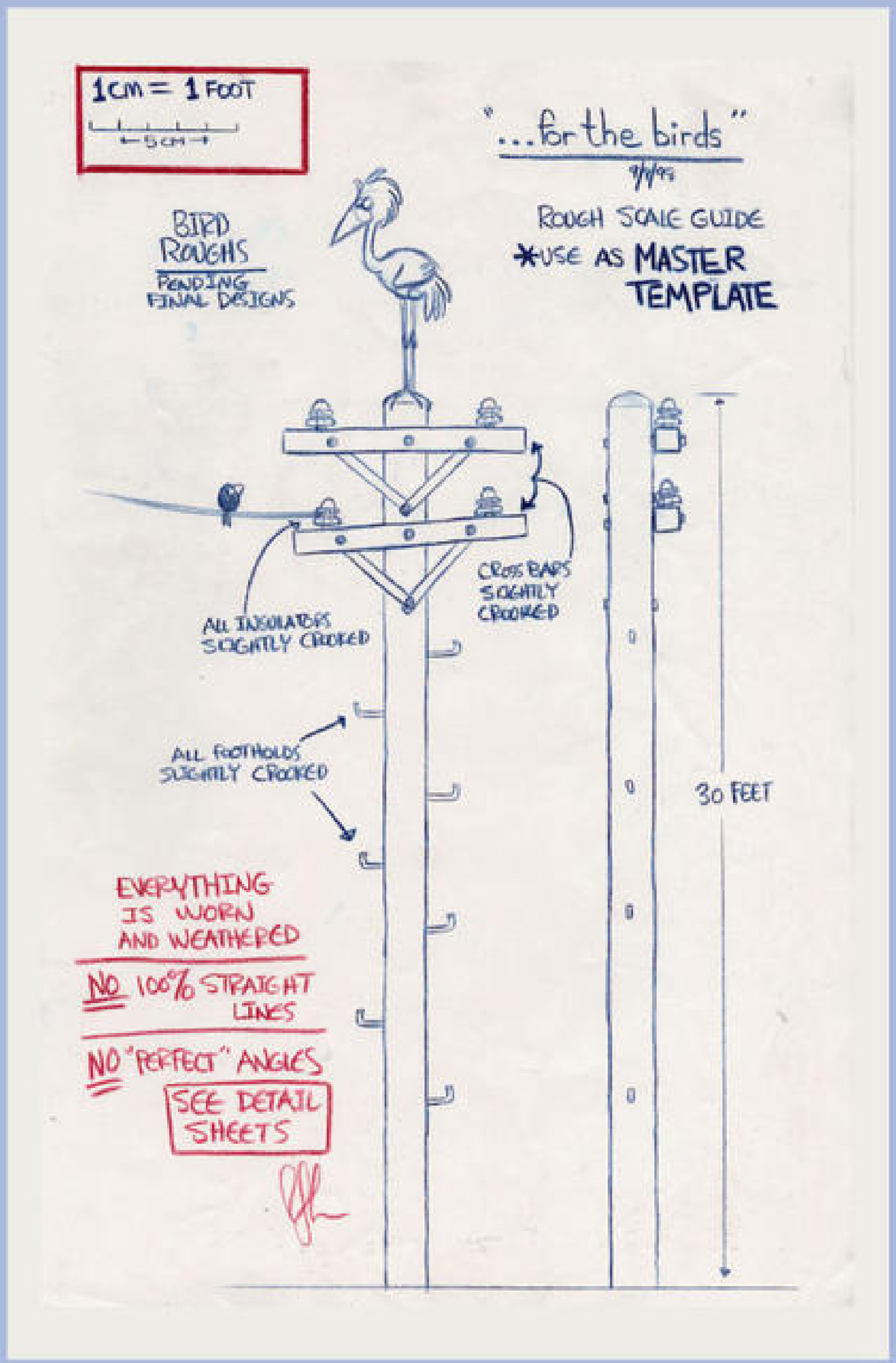


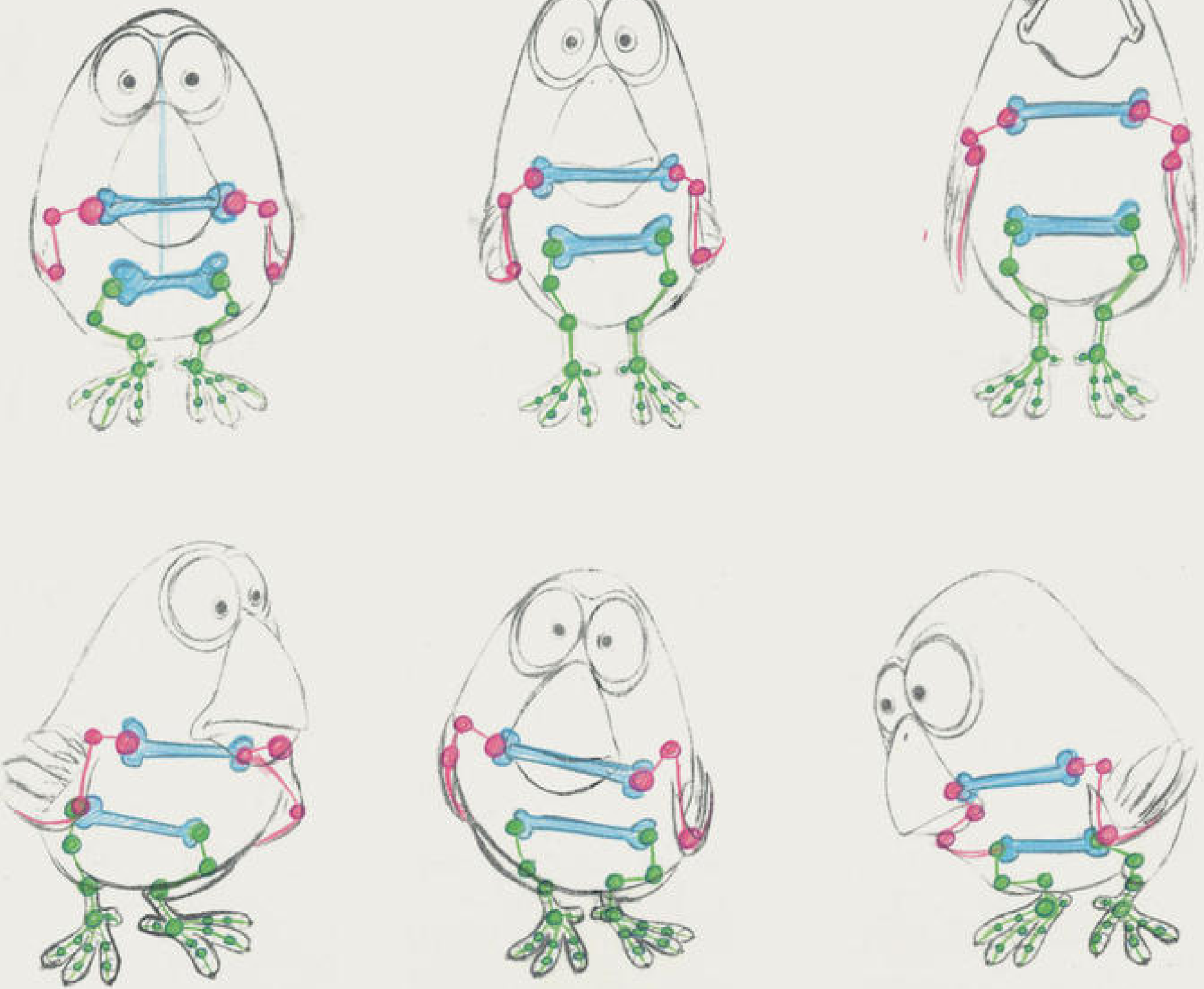


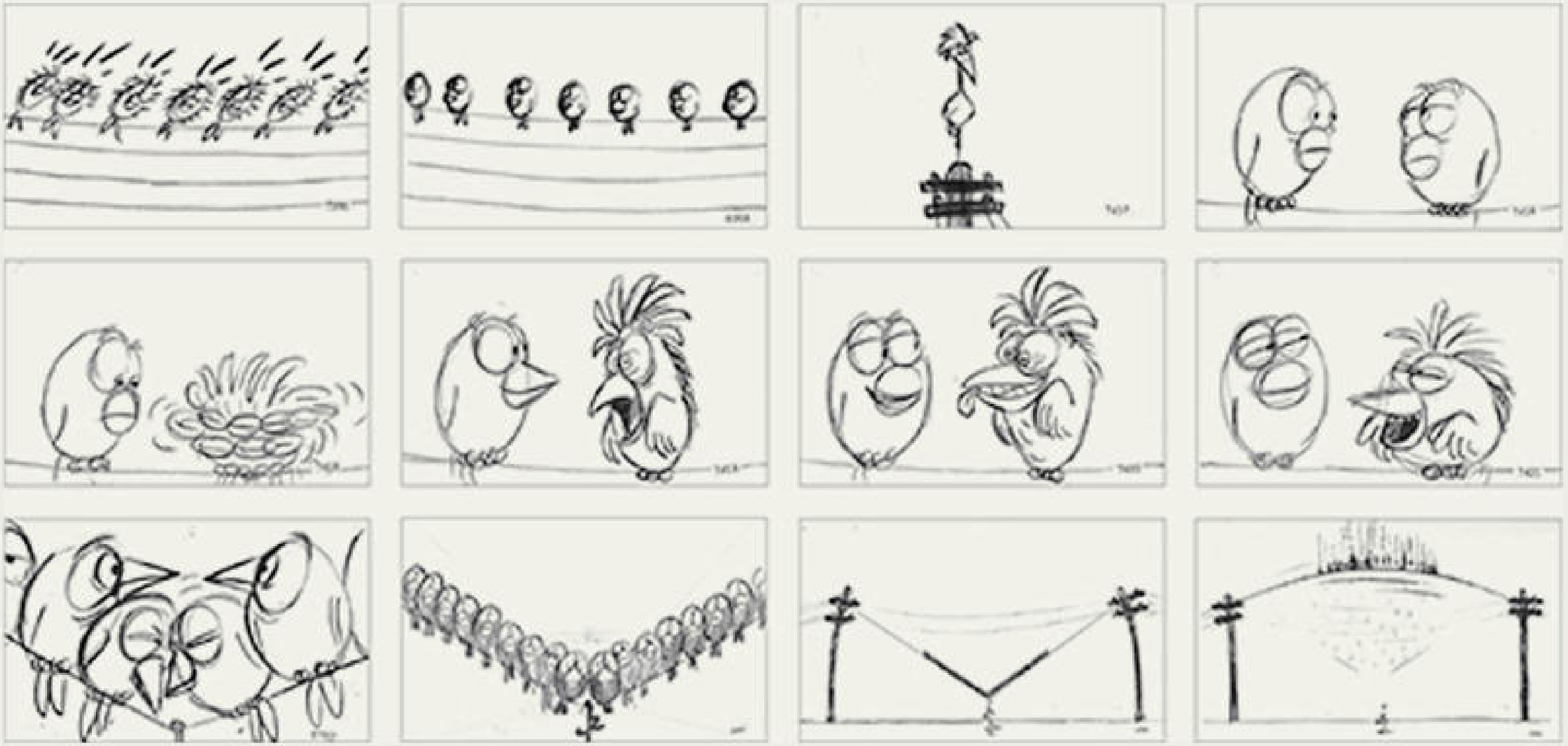
FOR THE BIRDS

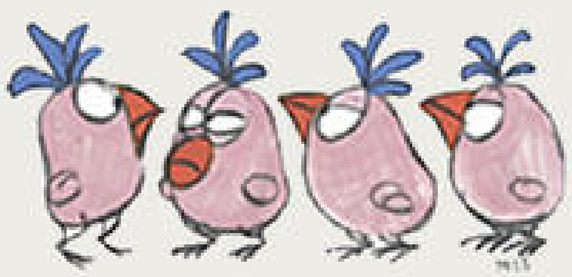
RELEASE DATE	2001
RUNNING TIME	3 minutes 20 seconds
WRITER	Ralph Eggleston
DIRECTOR	Ralph Eggleston

page	
90	**Leo Character Model Packet**, Ralph Eggleston, Pencil, 17" x 11", 2000
91	**Leo Concept Art**, Ralph Eggleston, Crayons, 6" x 4", 2000

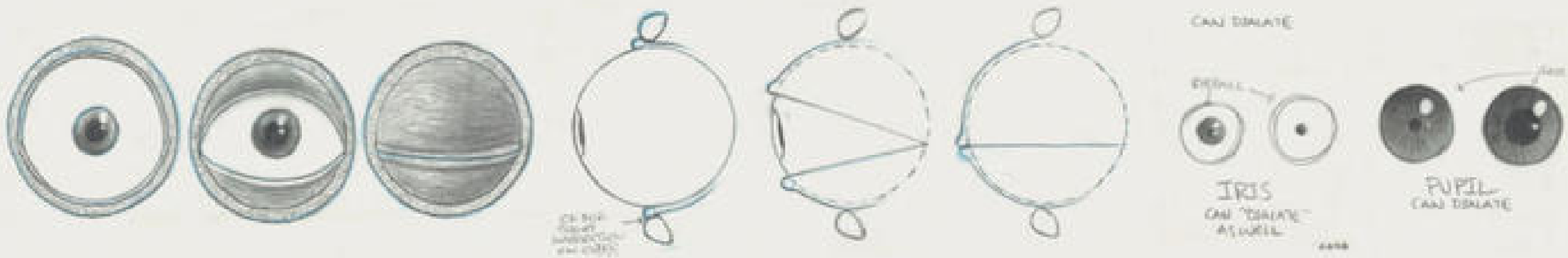

1cm = 1 FOOT
←5cm→
"...for the birds"
9/9/95
BIRD ROUGHS
PENDING FINAL DESIGNS
ROUGH SCALE GUIDE
*USE AS MASTER TEMPLATE
CROSS BARS SLIGHTLY CROOKED
ALL INSULATORS SLIGHTLY CROOKED
ALL FOOTHOLDS SLIGHTLY CROOKED
30 FEET
EVERYTHING IS WORN AND WEATHERED
NO 100% STRAIGHT LINES
NO "PERFECT" ANGLES
SEE DETAIL SHEETS







page	
90	(top) **Storyforthebirds,** Rolf Eggleston, Pencil, 17" x 11", 2000
	(bottom) **Storyforthebirds,** Rolf Eggleston, Pencil, 17" x 11", 2000

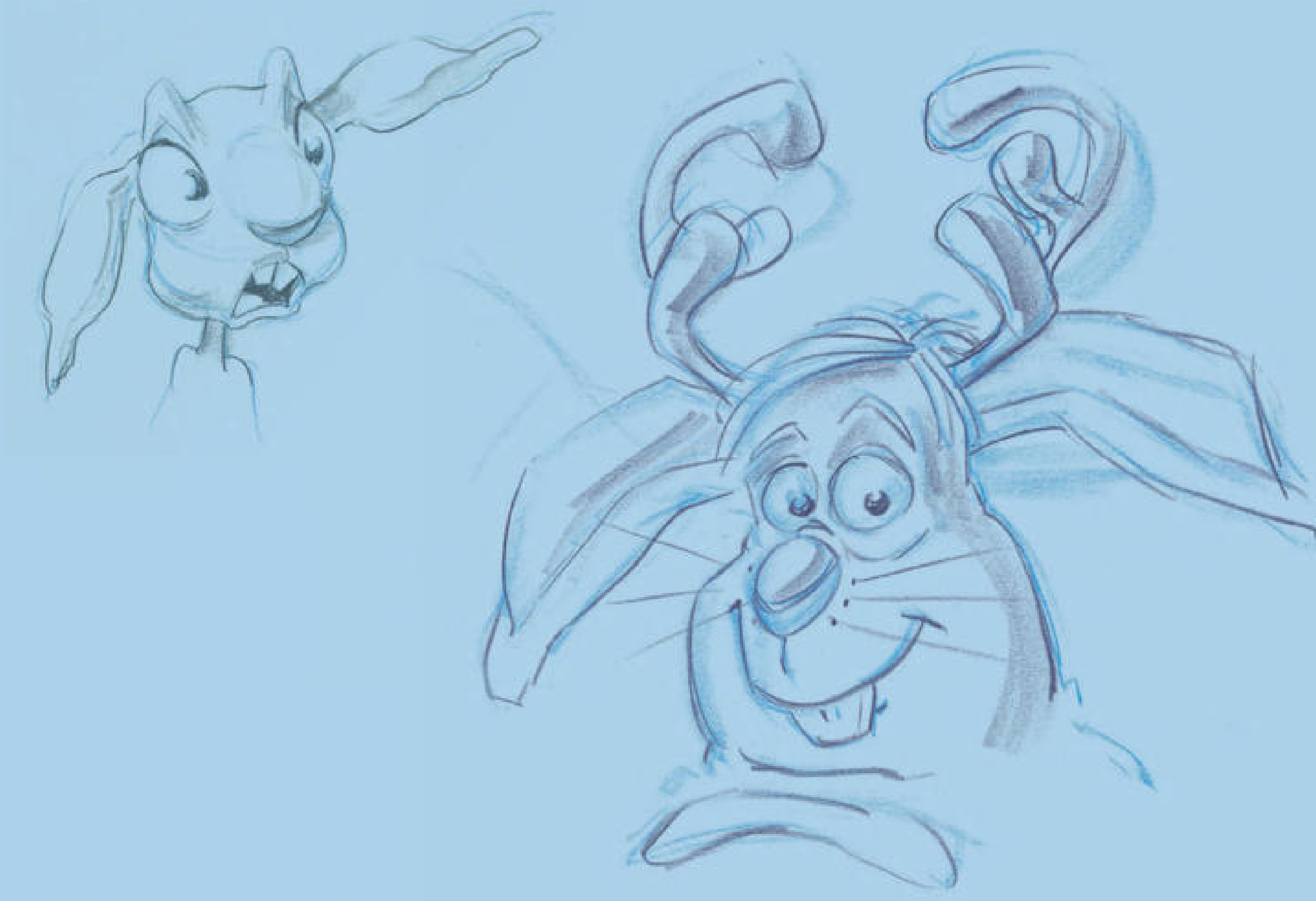


PAGE	
94	**Articulation Study**, Ralph Eggleston, Pencil, 11" x 17", 2000
95	(top) **Norm Character Model Packet**, Ralph Eggleston, Pencil, 17" x 11", 2000
	(bottom) **Norm Character Model Packet**, Ralph Eggleston, Pencil, 17" x 11", 2000

page	
97	**Concept Art**, Ralph Eggleston, Pastel, 7½" x 13¾", 2000
98	**Film Still**, 2000
99	**Film Still**, 2000

BOUNDIN'

RELEASE DATE	2004
RUNNING TIME	4 minutes 40 seconds
WRITER	Bud Luckey
DIRECTOR	Bud Luckey

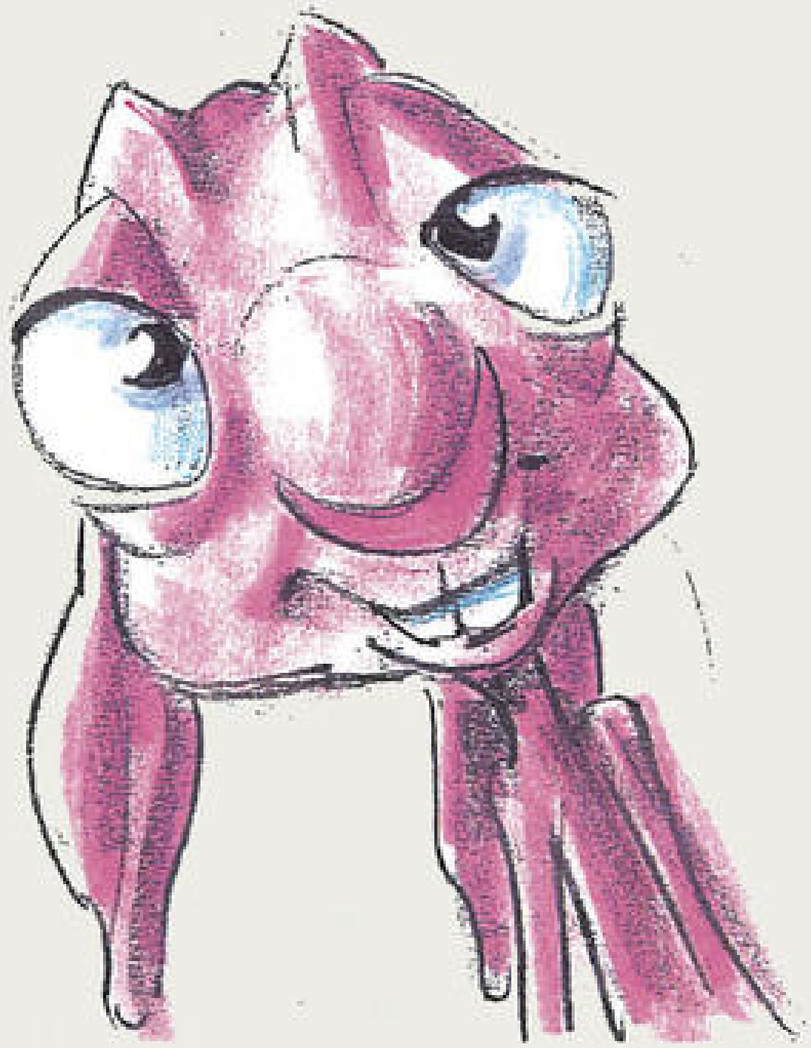


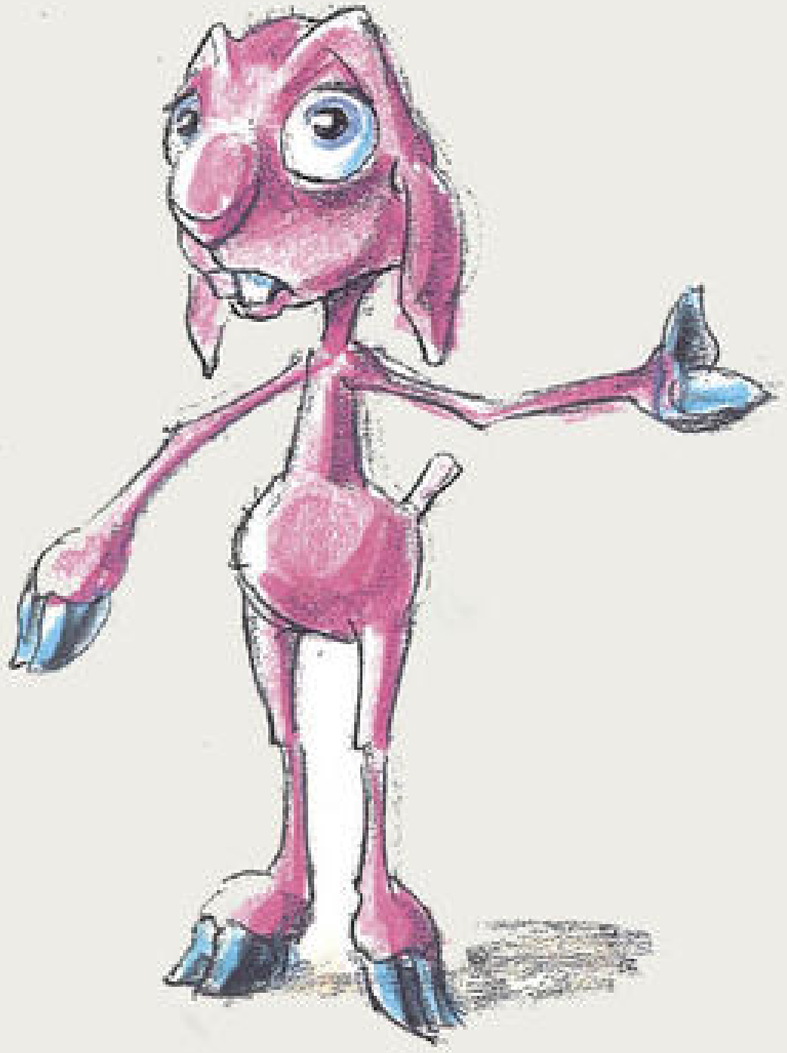
BOUDIL'

PAGE	
100	**Naked Lamb and Jackalope Concept Art** (details). Bud Luckey. Pencil. 11" x 17". 2002
101	**Title Design Concept Sketch.** Bud Luckey. Pencil. 2002
102	(top) **Color Script.** Dominique Louis. Digital. 2002
	(bottom) **Prairie Dog Concept Art** (detail). Bud Luckey. Pencil. 11" x 17". 2003

PAGE	
103	(above) **Wooly Lamb Concept Art**, Bud Luckey, Pencil, 11" x 17", 2003
	(right) **Lark, Owl, and Snake Concept Art** (detail), Bud Luckey, Pencil, 17" x 11", 2003

page	
104	**Film Still**, 2003
105	**Concept Art**, Bud Luckey, Pencil, 11" x 17", 2002





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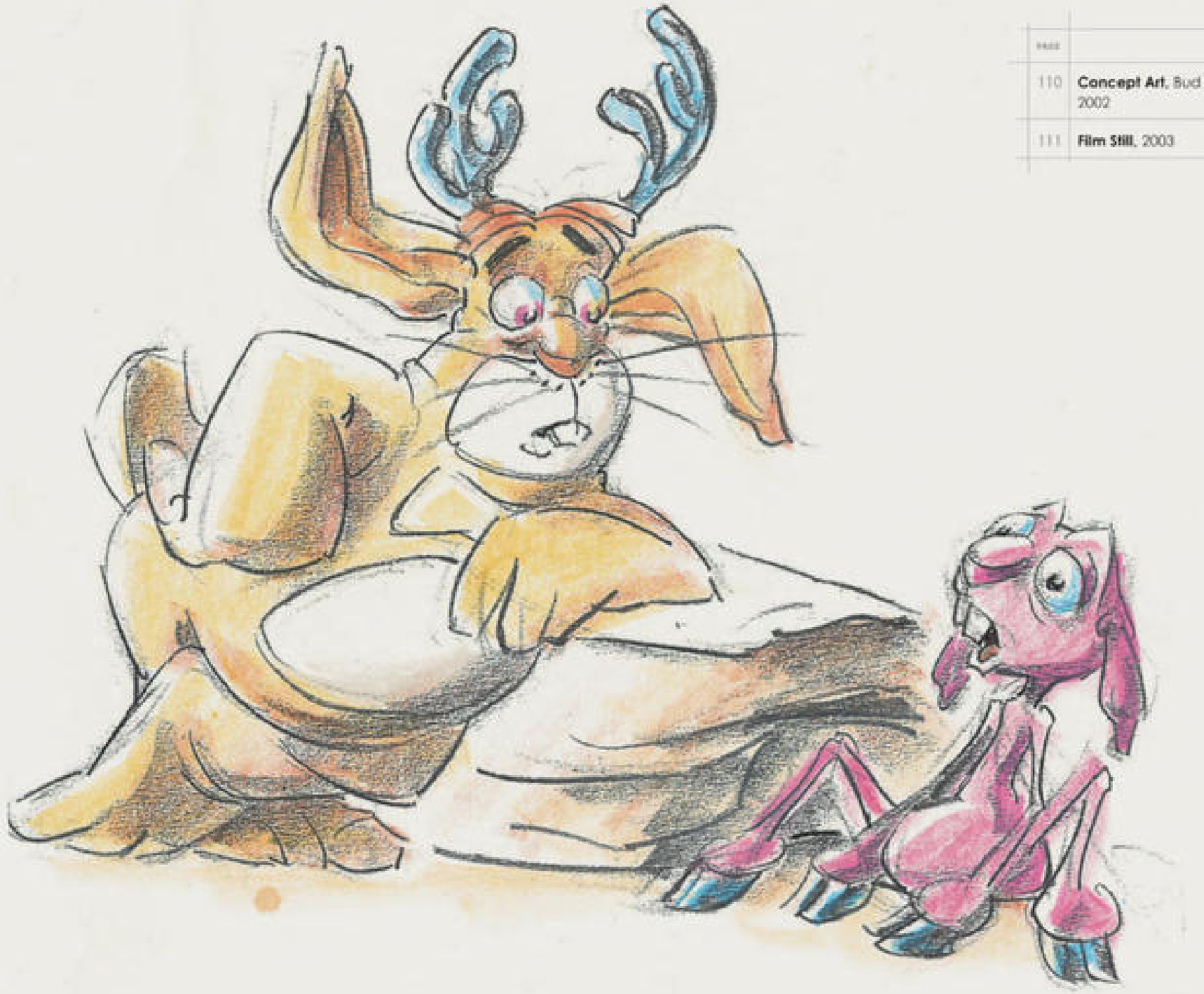
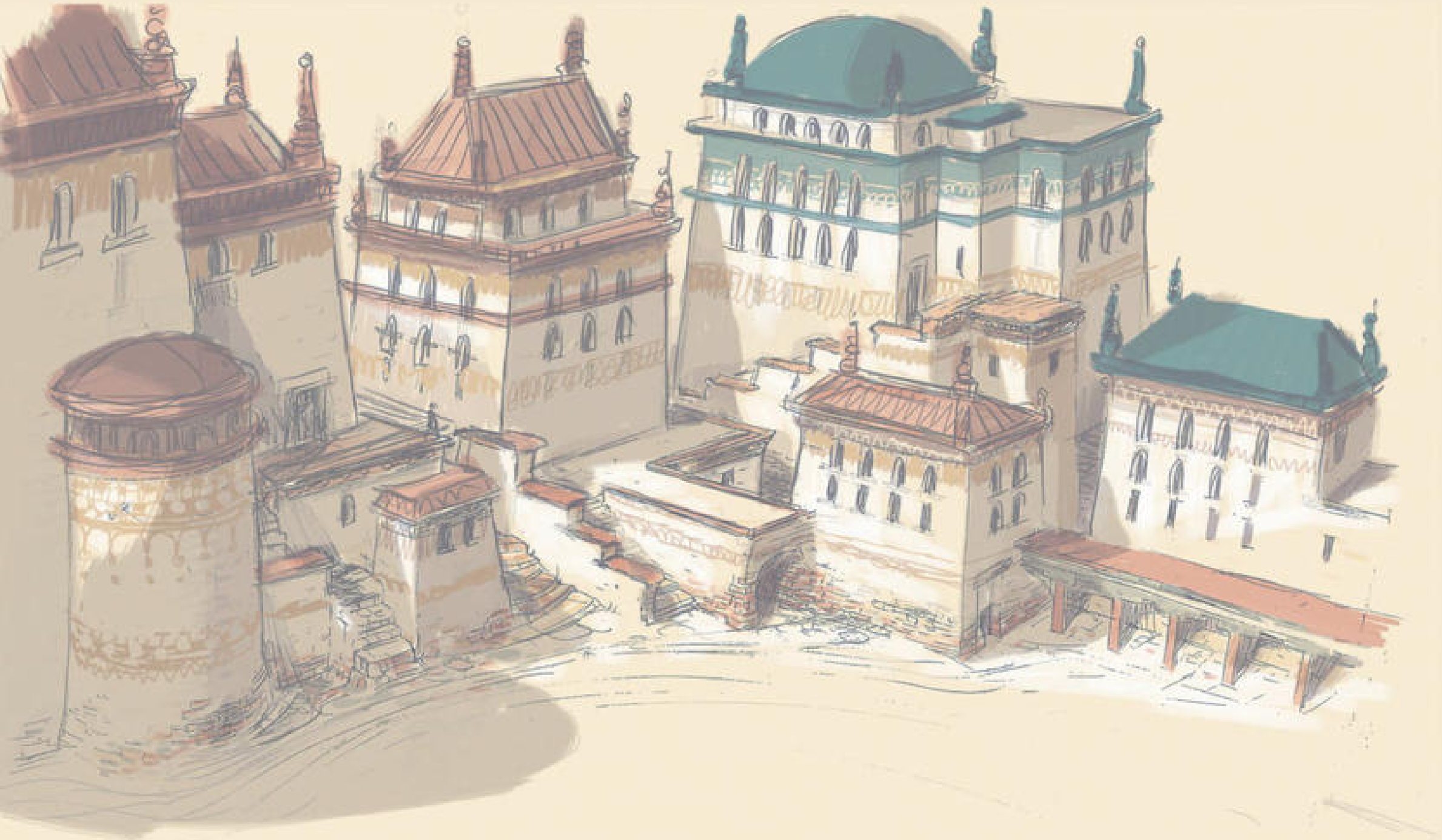
108	**Jackalope Concept Art**, Bud Luckey. Pencil, 11" x 17", 2002
109	**Wooly Lamb Concept Art**, Bud Luckey. Pencil, 11" x 17", 2002



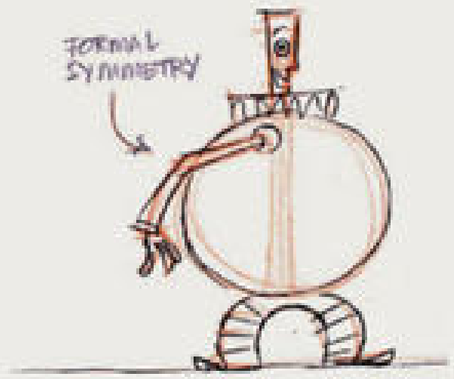
PAGE	
110	**Concept Art**, Bud Luckey, Pencil, 11" x 17", 2002
111	**Film Still**, 2003

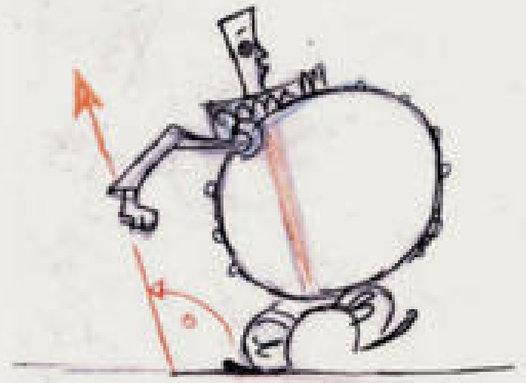
ONE MAN BAND

RELEASE DATE	2006
RUNNING TIME	4 minutes 30 seconds
WRITER	Andrew Jimenez & Mark Andrews
DIRECTOR	Andrew Jimenez & Mark Andrews

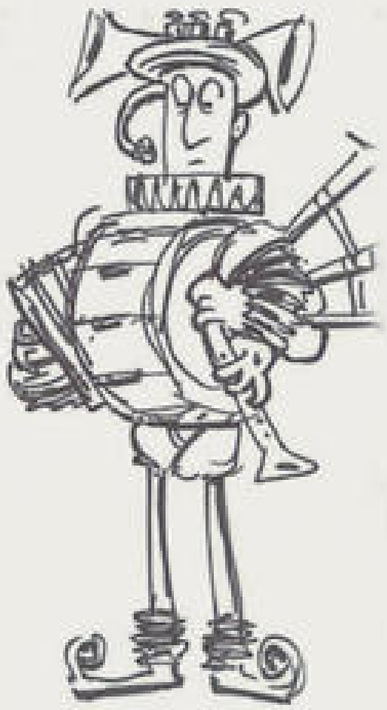


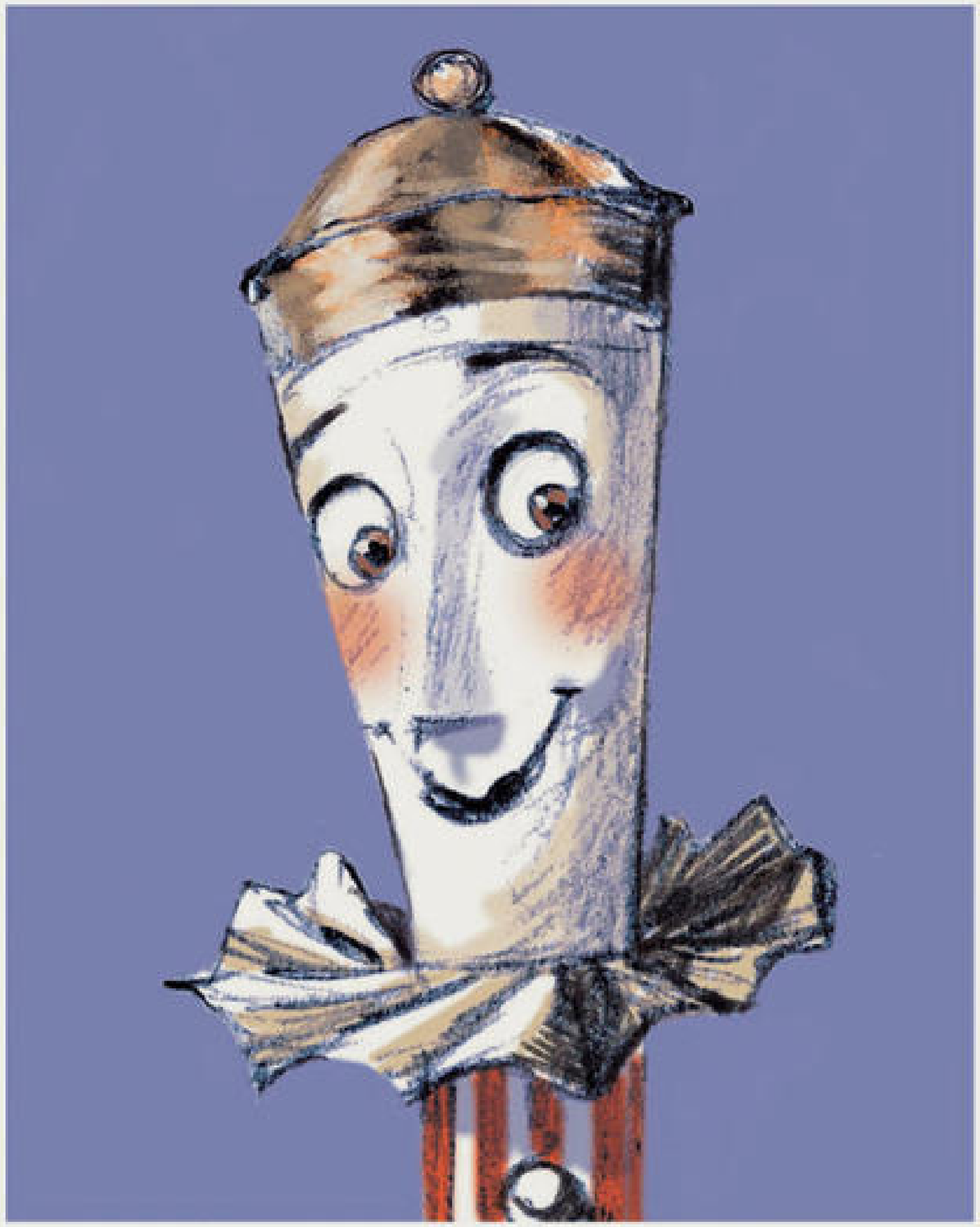
PAGE	
112	**Concept Art**, Jason Deamer, Pencil, 12½" x 10½", 2004
113	**Concept Art**, Mark Andrews, Marker, Pencil with Digital Paint, 8½" x 11", 2003
114	**Village Design**, Ronnie Del Carmen, Digital, 2003
115	(top, left) **Set Concept Art**, Ronnie del Carmen, Pastel, 5" x 5", 2003
	(top, right) **Tippy Facial Topology**, Ronnie del Carmen, Pencil & Digital Paint, 8½" x 11", 2003
	(bottom) **Concept Art**, Ronnie del Carmen, Digital, 2003


FORMAL
SYMMETRY

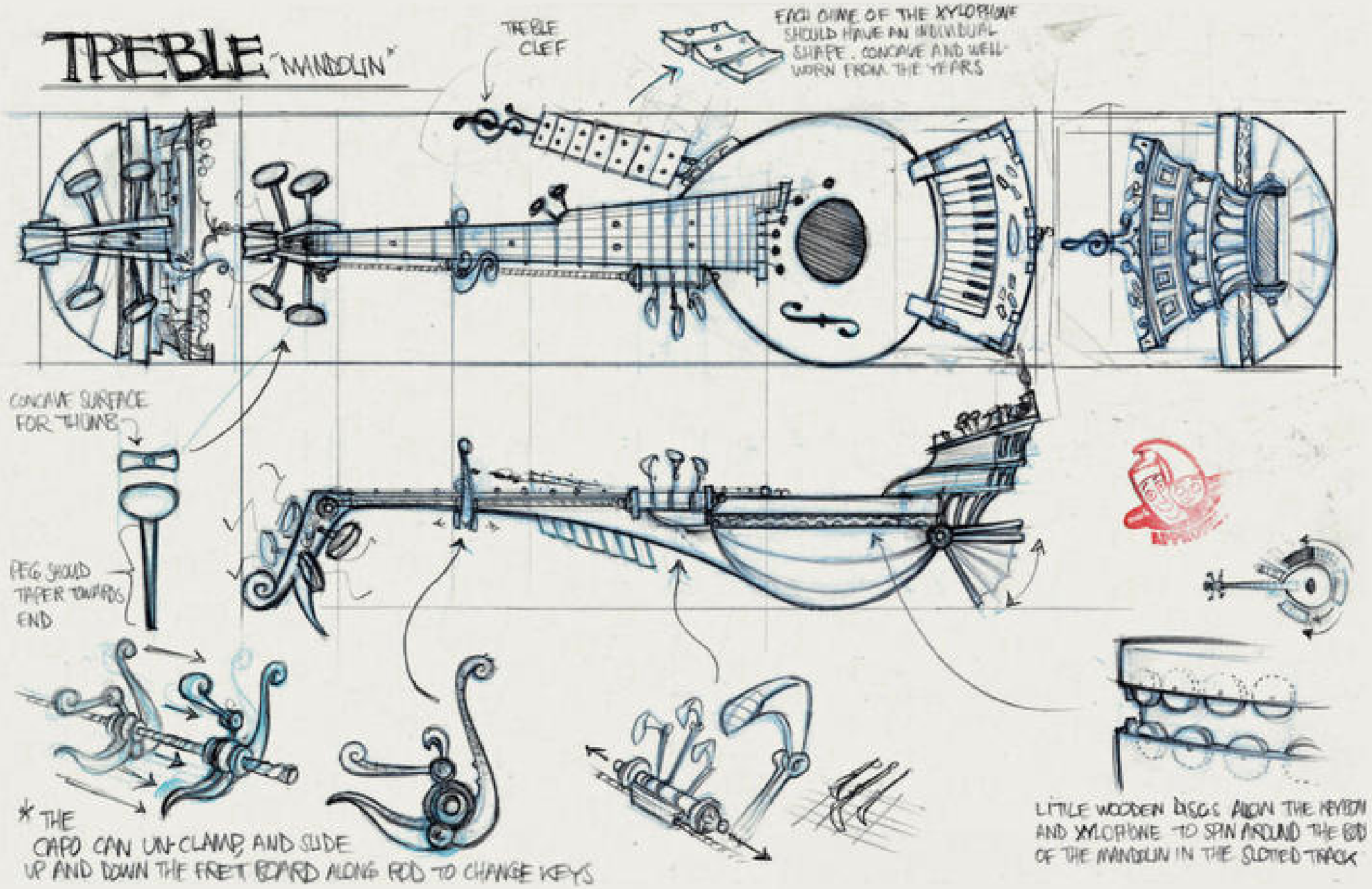


& SYMMETRY





PAGE	
116	(left) **Bass Character Study**, Ronnie del Carmen, Pencil & Digital, 8" x 6", 2004
	(right) **Bass Attitude Studies** (detail), Ronnie del Carmen, Pencil & Pen, 30" x 20", 2003
117	(left) **Bass Concept Art**, Mark Andrews, Marker, 8½" x 11", 2003
	(right) **Bass Face Study**, Ronnie del Carmen, Pencil & Digital, 6" x 5", 2003

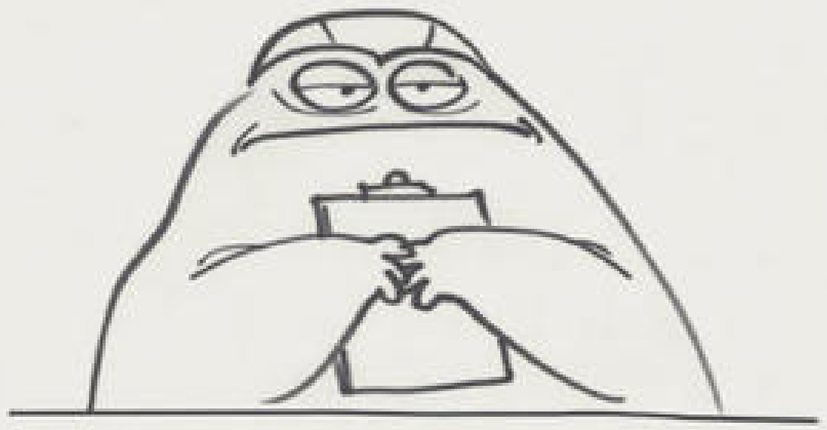

TREBLE "MANDOLIN"
TREBLE CLEF
EACH CHIME OF THE XYLOPHONE SHOULD HAVE AN INDIVIDUAL SHAPE, CONCAVE AND WELL WORN FROM THE YEARS
CONCAVE SURFACE FOR THUMB
PEG SHOULD TAPER TOWARDS END
* THE CAPO CAN UN-CLAMP AND SLIDE UP AND DOWN THE FRET BOARD ALONG ROD TO CHANGE KEYS
LITTLE WOODEN DISCS ALLOW THE KEYBOARD AND XYLOPHONE TO SPIN AROUND THE BOD OF THE MANDOLIN IN THE SLOTTED TRACK

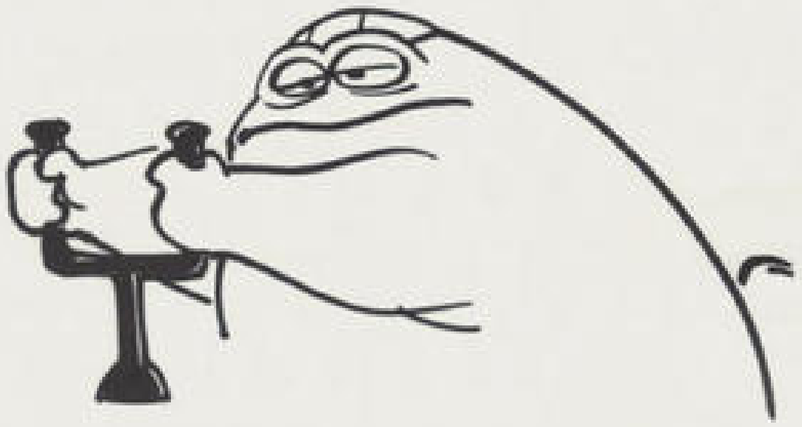
PAGE	
120	**Concept Art,** Mark Andrews, Digital, 2006
121	**Fountain/Town Square Design,** Ronnie del Carmen, Pastel & Digital Paint, 2003

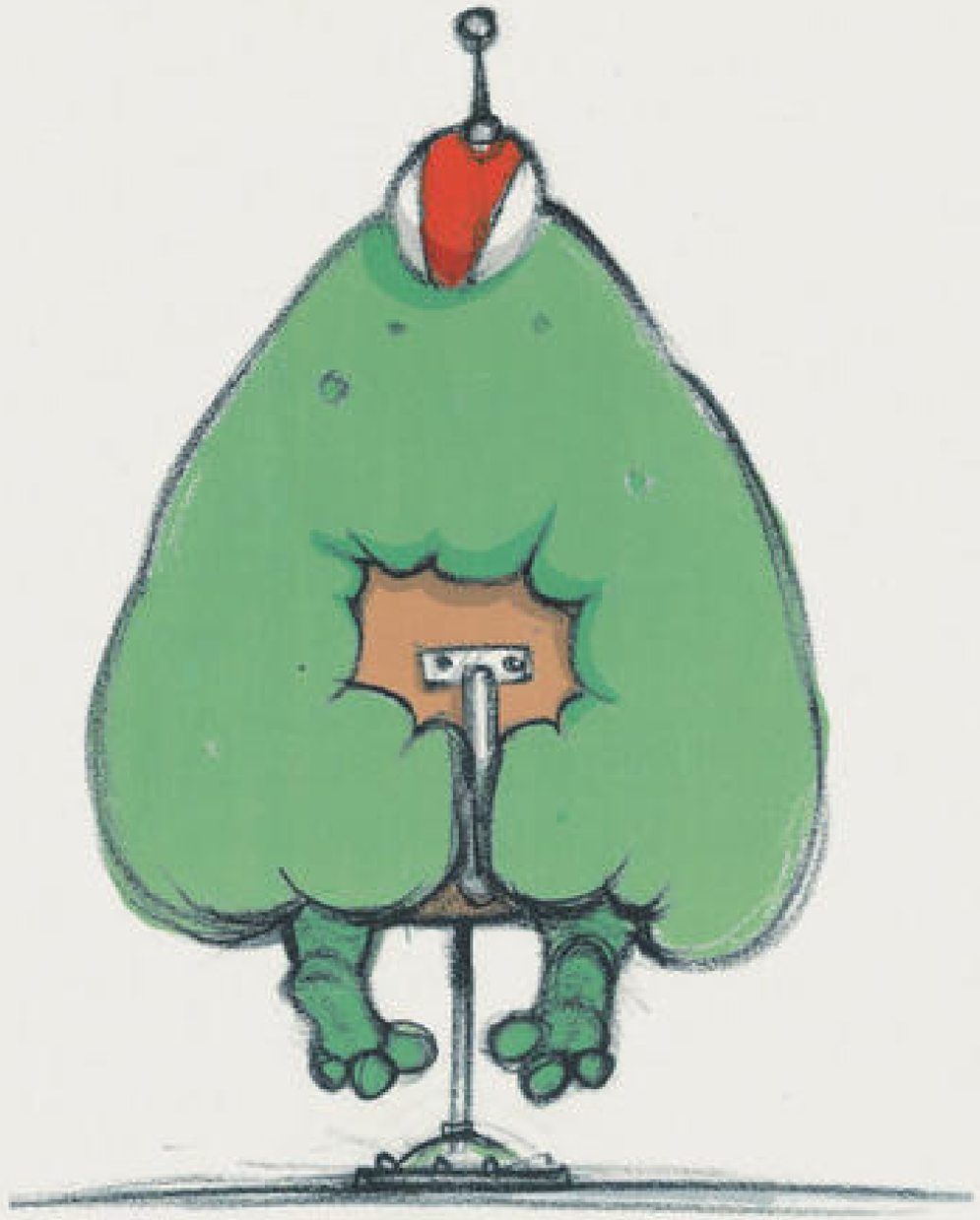
page	
122	**Tippy Character Study,** Ronnie del Carmen, Pencil & Digital, 11" x 17", 2003
123	(top) **Film Still,** 2006
	(bottom) **Tippy Character Study** (detail), Ronnie del Carmen, Pencil & Digital, 17" x 22", 2003

LIFTED

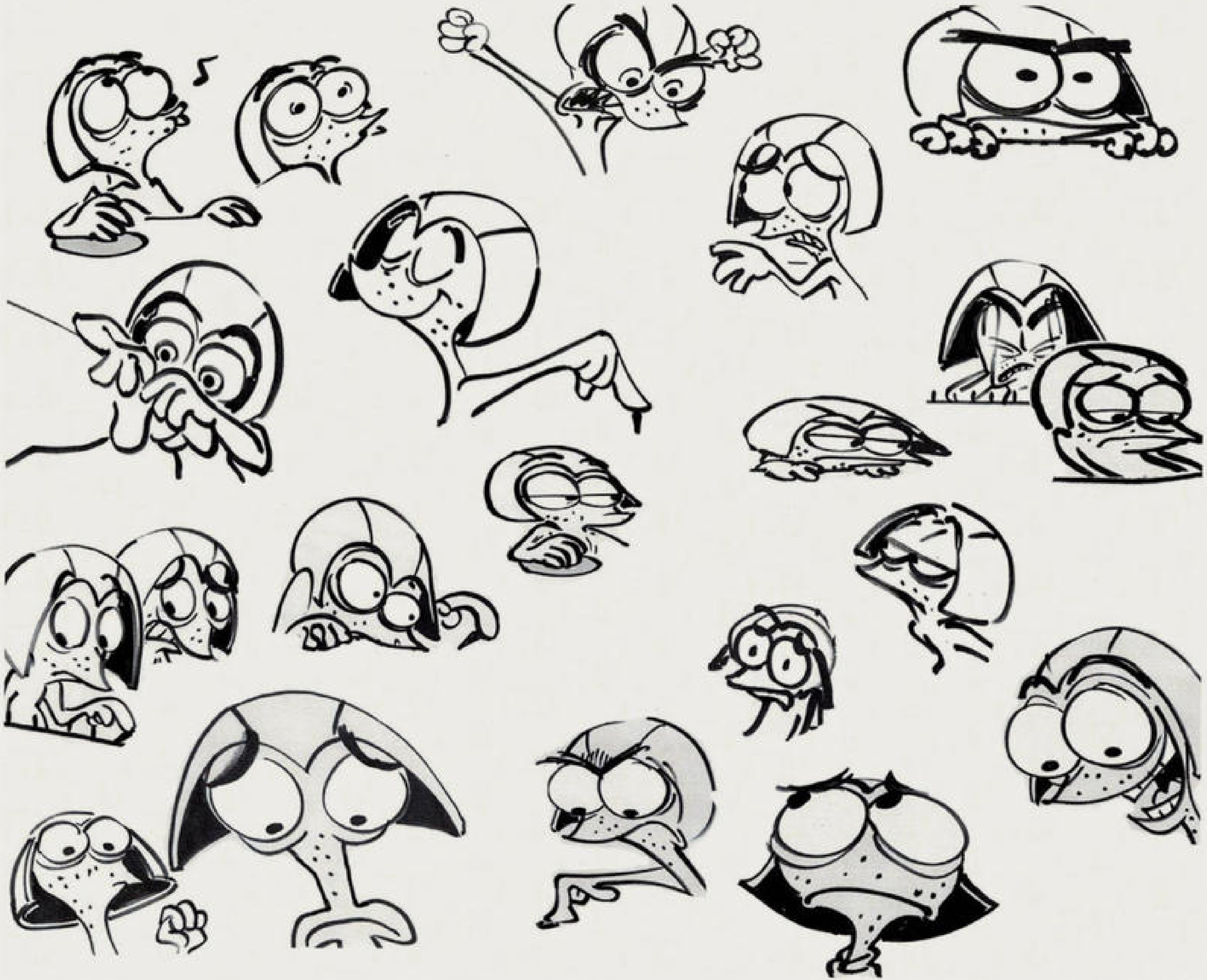
RELEASE DATE	2007
RUNNING TIME	5 minutes
WRITER	Gary Rydstrom
DIRECTOR	Gary Rydstrom

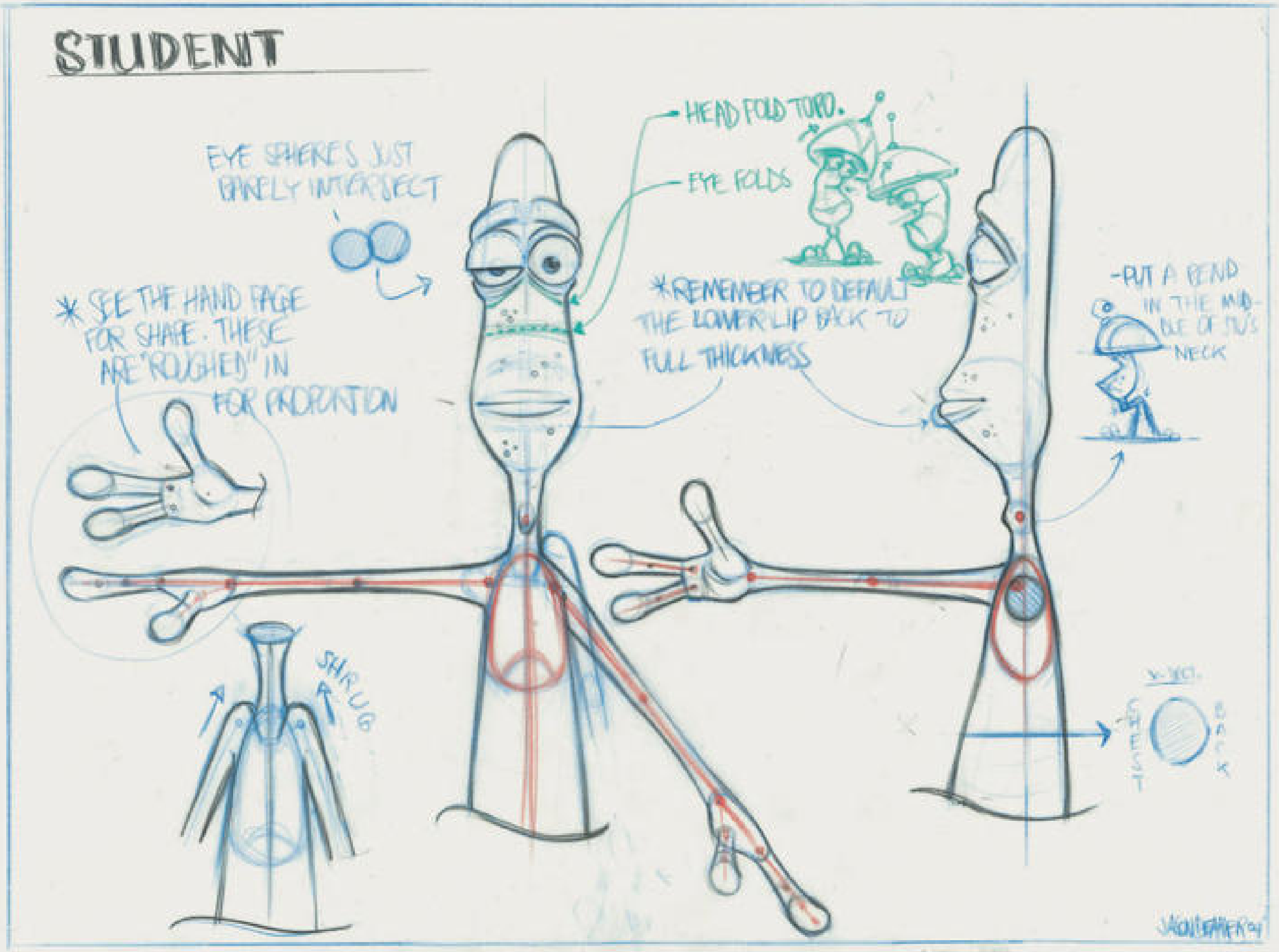




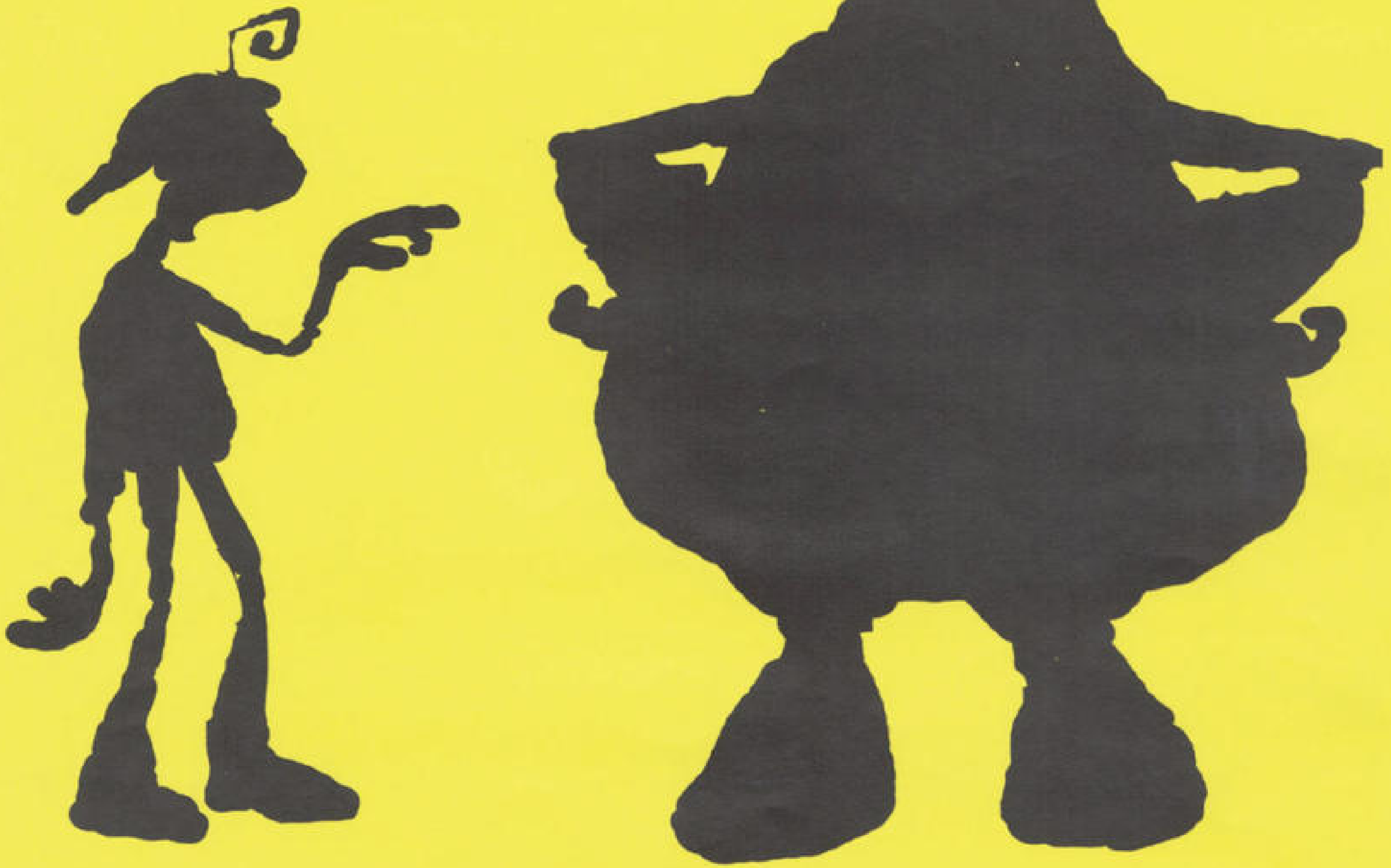


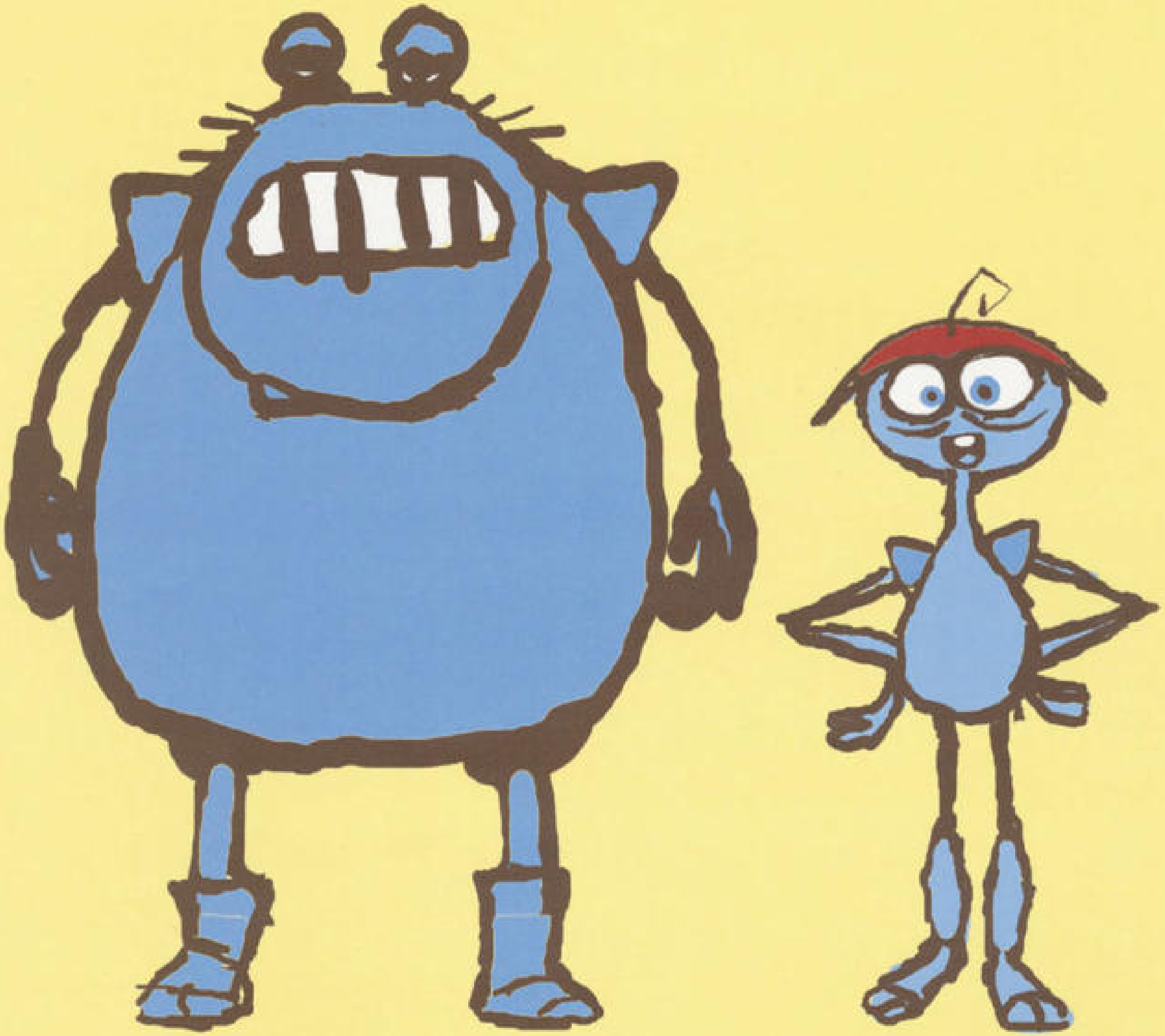
PAGE	
124	**Concept Art,** Don Lee, Pen, 12½" x 10½", 2004
125	**Stu Concept Art,** Jason Deamer, Pencil & Digital Paint, 2004
126	(left) **Mr. B Concept Art,** Jeff Pidgeon, Marker, 13" x 11", 2004
	(right) **Mr. B Concept Art,** Jason Deamer, Pencil & Digital Paint, 2004
127	**Storyboards** (details of Stu's facial expressions), Jeff Pidgeon, Marker, 13" x 11", 2004

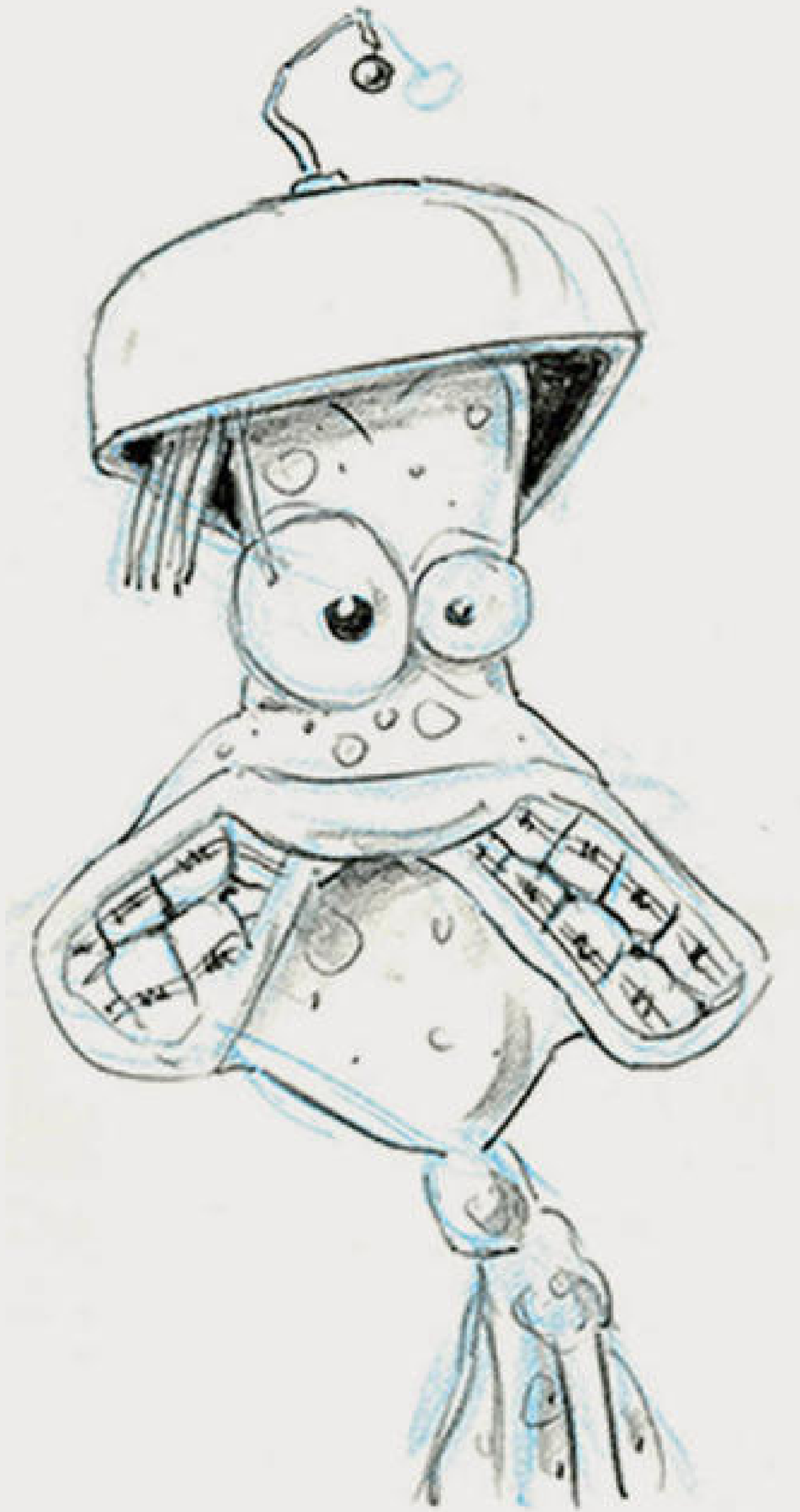


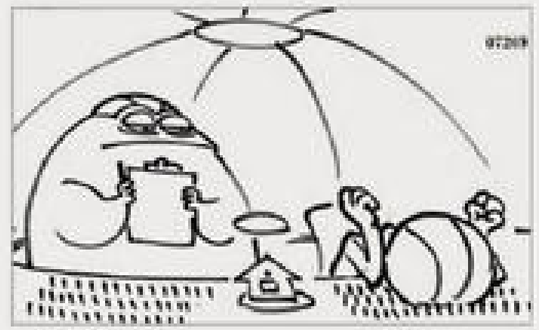

STUDENT
EYE SPHERES JUST BARELY INTERSECT
* SEE THE HAND PAGE FOR SHAPE. THESE ARE "ROUGHED" IN FOR PROPORTION
HEAD FOLD TORD.
EYE FOLDS
* REMEMBER TO DEFAULT THE LOWER LIP BACK TO FULL THICKNESS
-PUT A BEND IN THE MID-DLE OF TJ'S NECK
SHRUG
CHEST
BACK
JACK TAMER '94

PAGE	
128	**Stu Model Packet**, Jason Deamer, Pencil, 11" x 17", 2004
129	(left and right) **Stu Concept Art**, Jason Deamer, Pencil, 13½" x 17", 2004
	(center) **Stu Concept Art**, Jason Deamer, Pencil & Marker, 10½" x 13", 2004
130	**Concept Art**, Dan Lee, Digital, 2004
131	**Concept Art**, Dan Lee, Digital, 2004









FEATURE FILM–BASED SHORTS

Mike's New Car

Jack-Jack Attack

Mater and the Ghostlight

PANEL #

SEQUENCE #

DATE

ARTIST

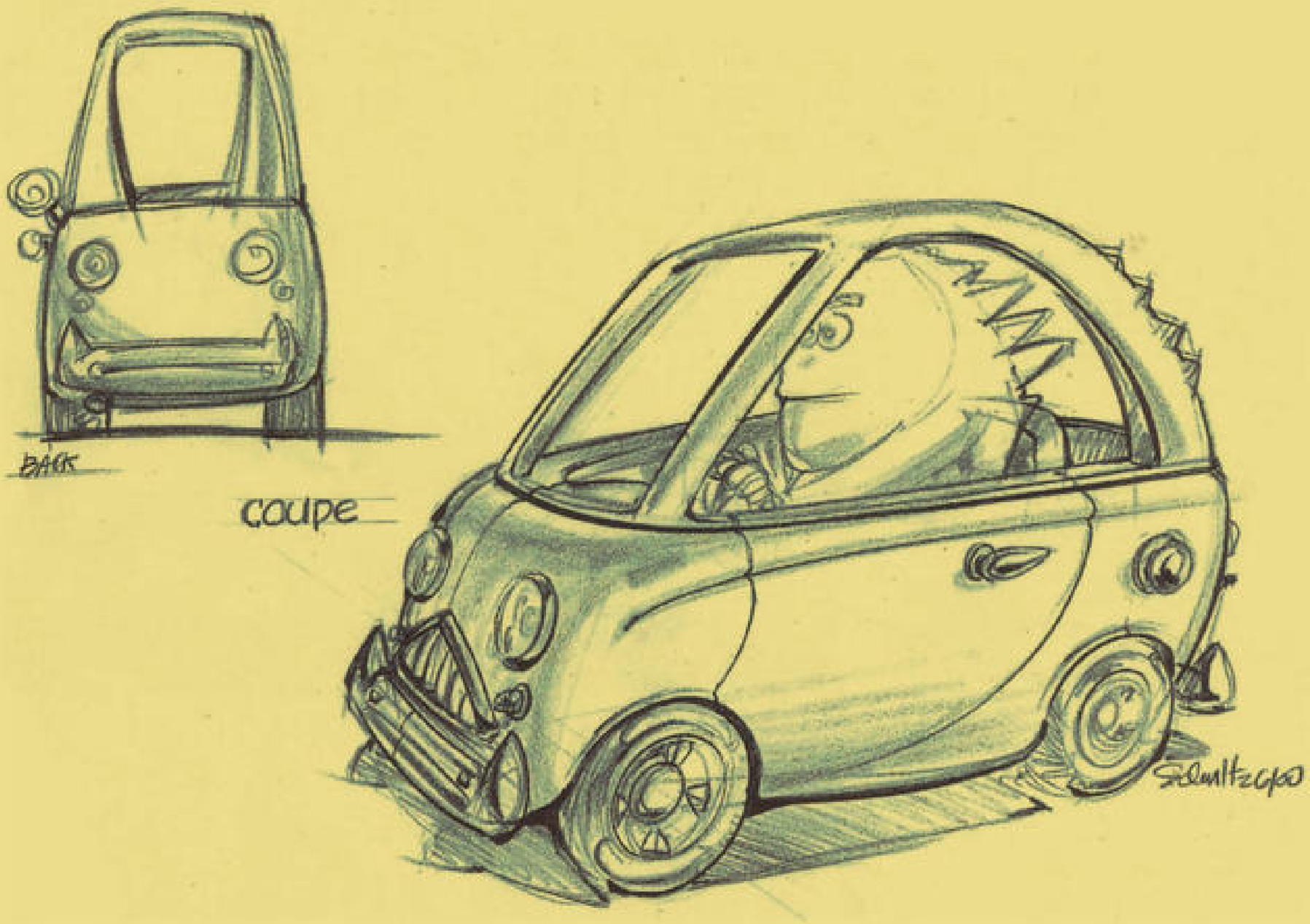
"CARS"

PROJECT

DIALOGUE:

MIKE'S NEW CAR

RELEASE DATE	2002
RUNNING TIME	3 minutes 45 seconds
WRITER	Pete Docter
DIRECTOR	Pete Docter



DASH COMPONENTS

- PARTS TO MODEL INTO MAYA FILE ✱
- ALL NEW SWITCHES SHOULD HAVE A MATTE GREY SHADER ASSIGNMENT.

VENTS

ALL VENTS ARE: MI STEREO WITH SHELL BACK

✱ KELSMAN RIVETS LIKE THIS

GUAGES FROM COFFEEMACHINE (NEW GRAPHICS & CURVE POINTER)

✱ SINK UNIT

SINK UNIT

MI LIGHT SWITCH

MI STEREO

SINK UNIT

TV BUTTONS

MI PHONE KEYPAD

MI LIGHTSWITCH

MI LIGHTSWITCH

MI KEYPAD LIGHTS (PHIE TUBES)

TV BUTTON

✱ROCKER

MI STEREO

MISTEREO LIGHTS

MI LIGHT SWITCH

KID ALARM

ALL SMALL PIECES ARE: ✱ KNOBS

MI KEYPAD ROUND LIGHT

MI STEREO VENT

TV BUTTONS

MI STEREO

COFFEE MACHINE

MI STEREO

MISCREAN OUTLETS (WHOLESALE)

MI KEYPAD SQUARE BUTTONS

MI STEREO

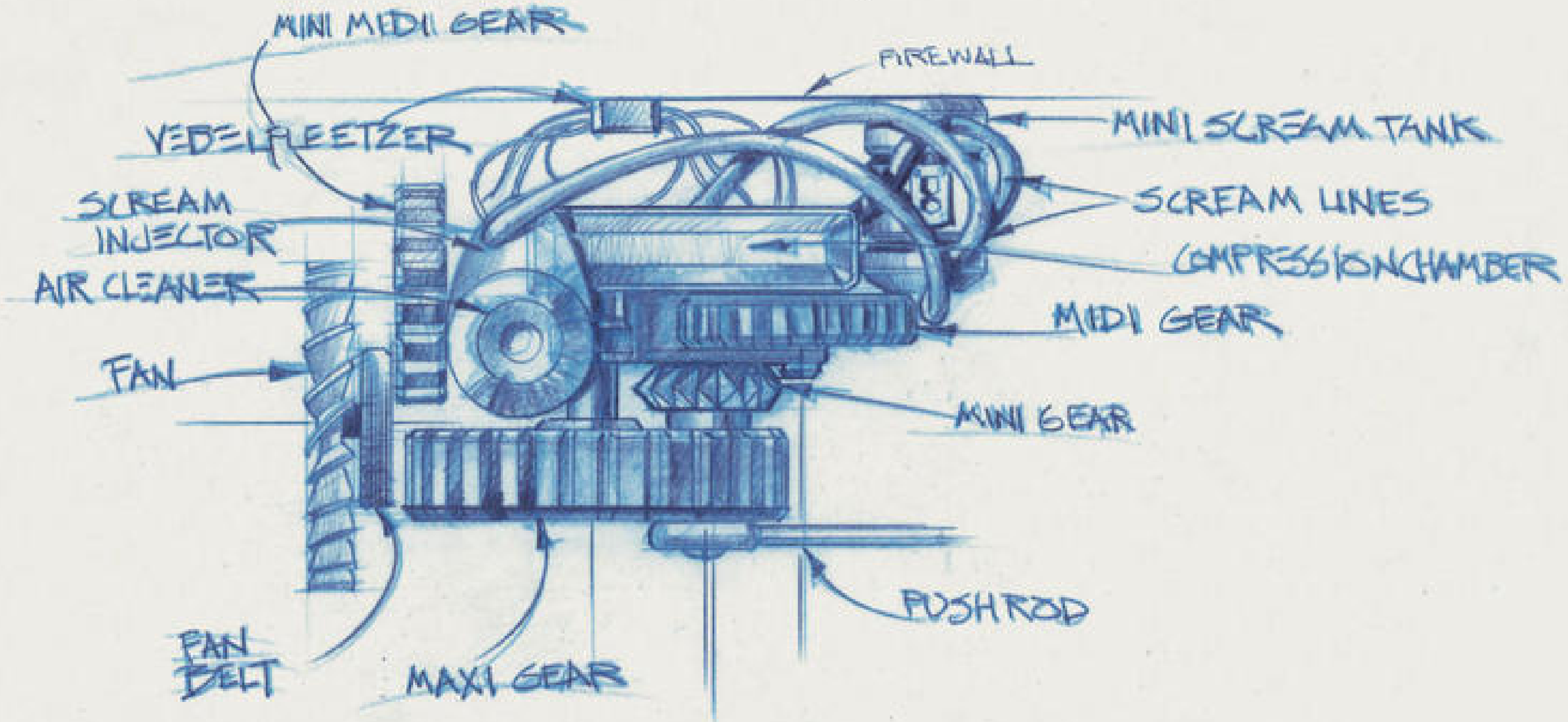
MI LIGHT

SINK UNIT

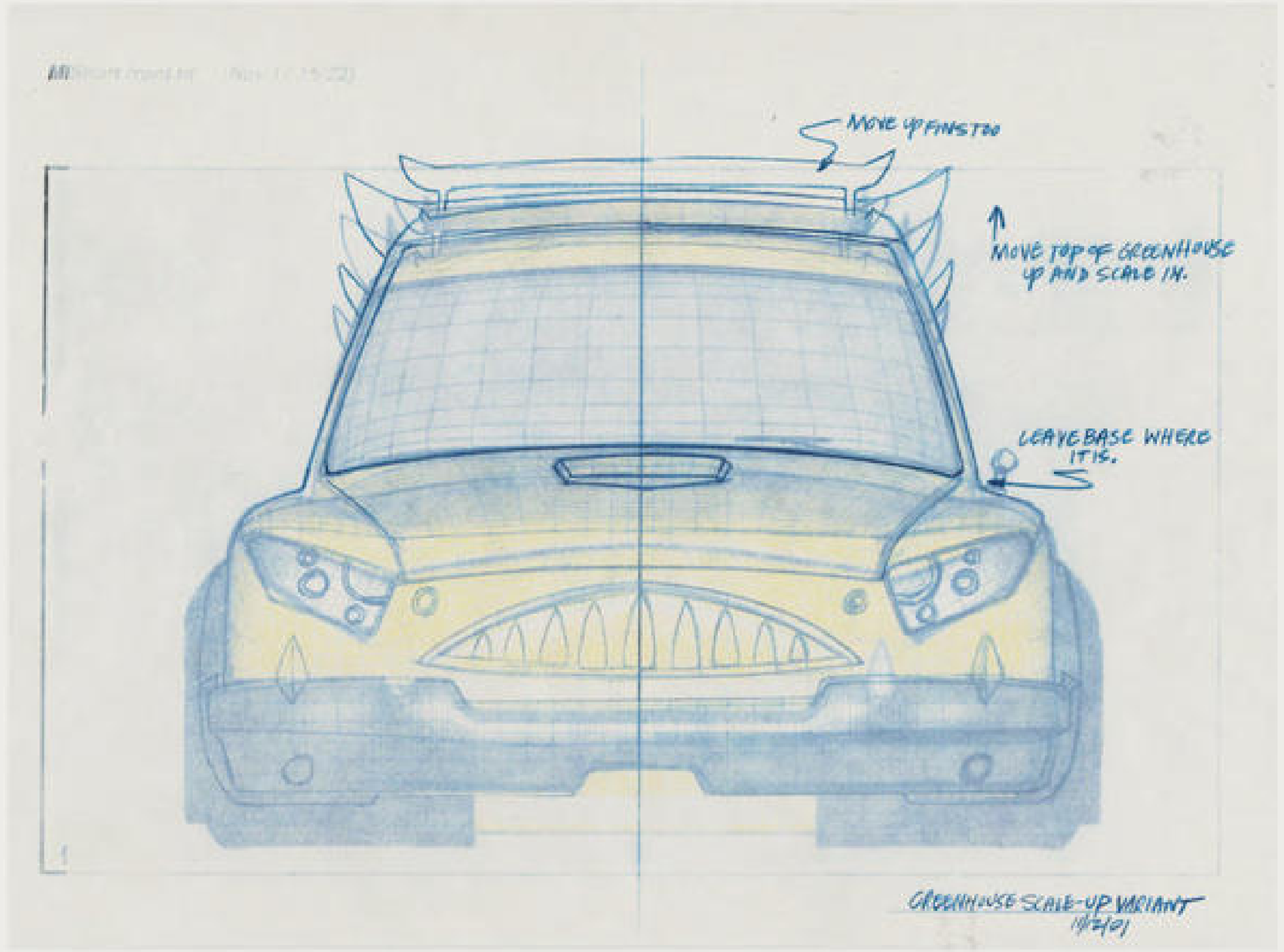
EXTRACTOR CHAIR (ARM UNIT ONLY)

SINK UNIT

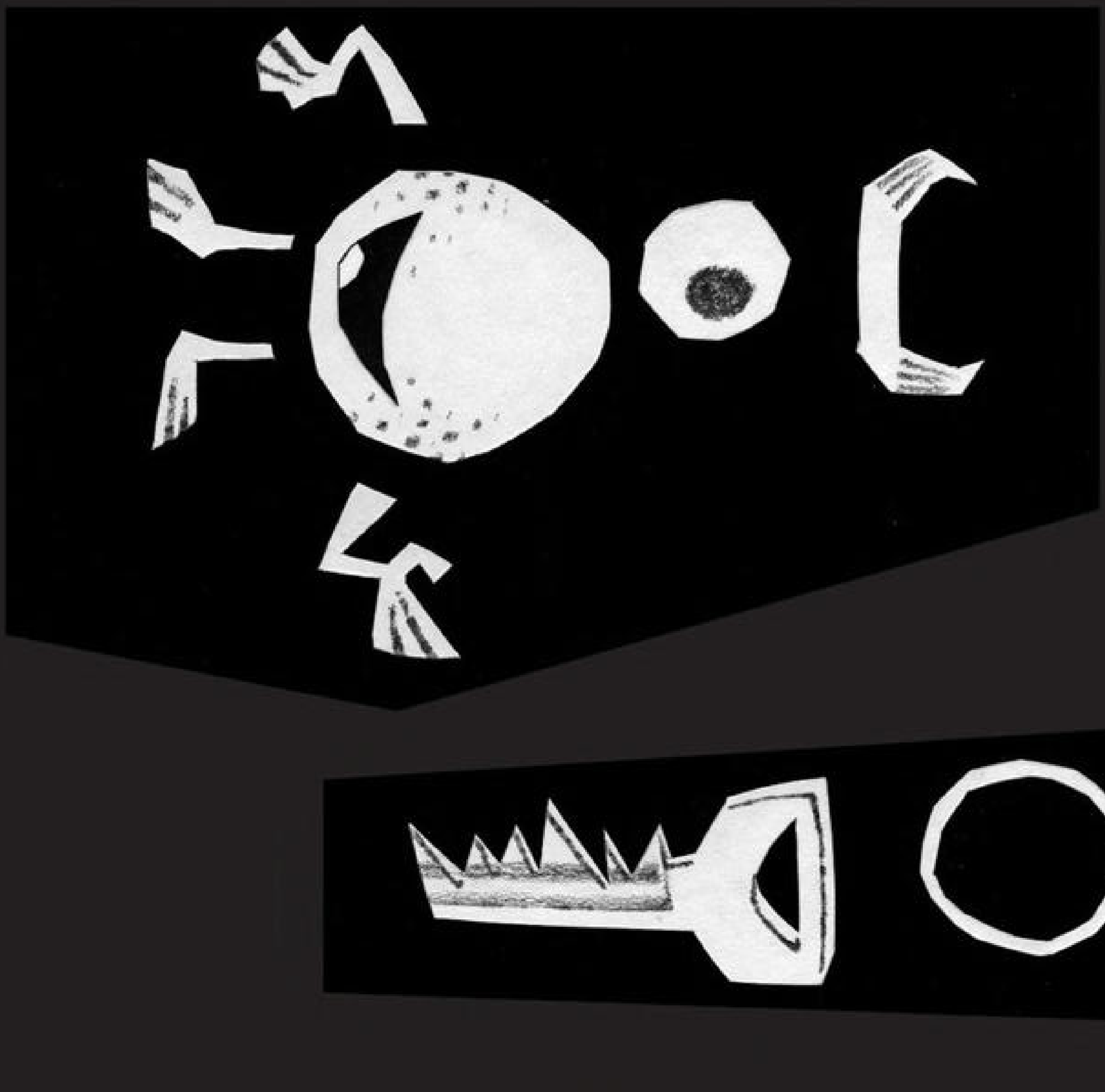
MI LIGHTSWITCH

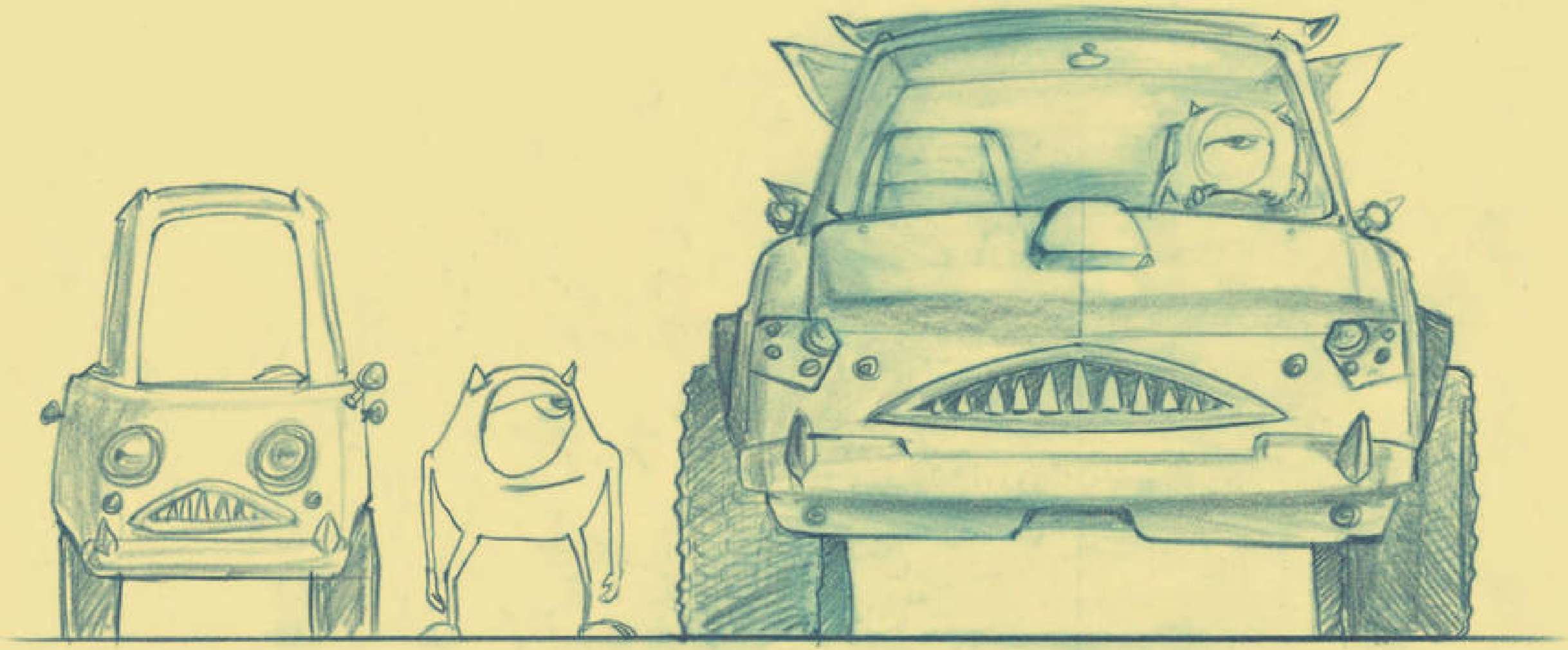


PAGE	
137	**Story Concept Art:** *Mater and the Ghostlight*, Dan Scanlon, Marker, 9" x 5", 2005
138	**Coupe Model Packet**, Gary Schultz, Pencil, 8½" x 11", 2000
139	(top) **Car Model Packet**, Gary Schultz, Pencil, 17" x 11", 2000
	(bottom) **Early Thumbnail Story Sketches** (detail): Pete Docter, Pencil, 14" x 11", 2000



PAGE	
140	**Car Model Packet:** Gary Schultz, Pencil, 17" x 11", 2000
141	**Car Model Packet:** Gary Schultz, Pencil, 17" x 11", 2000

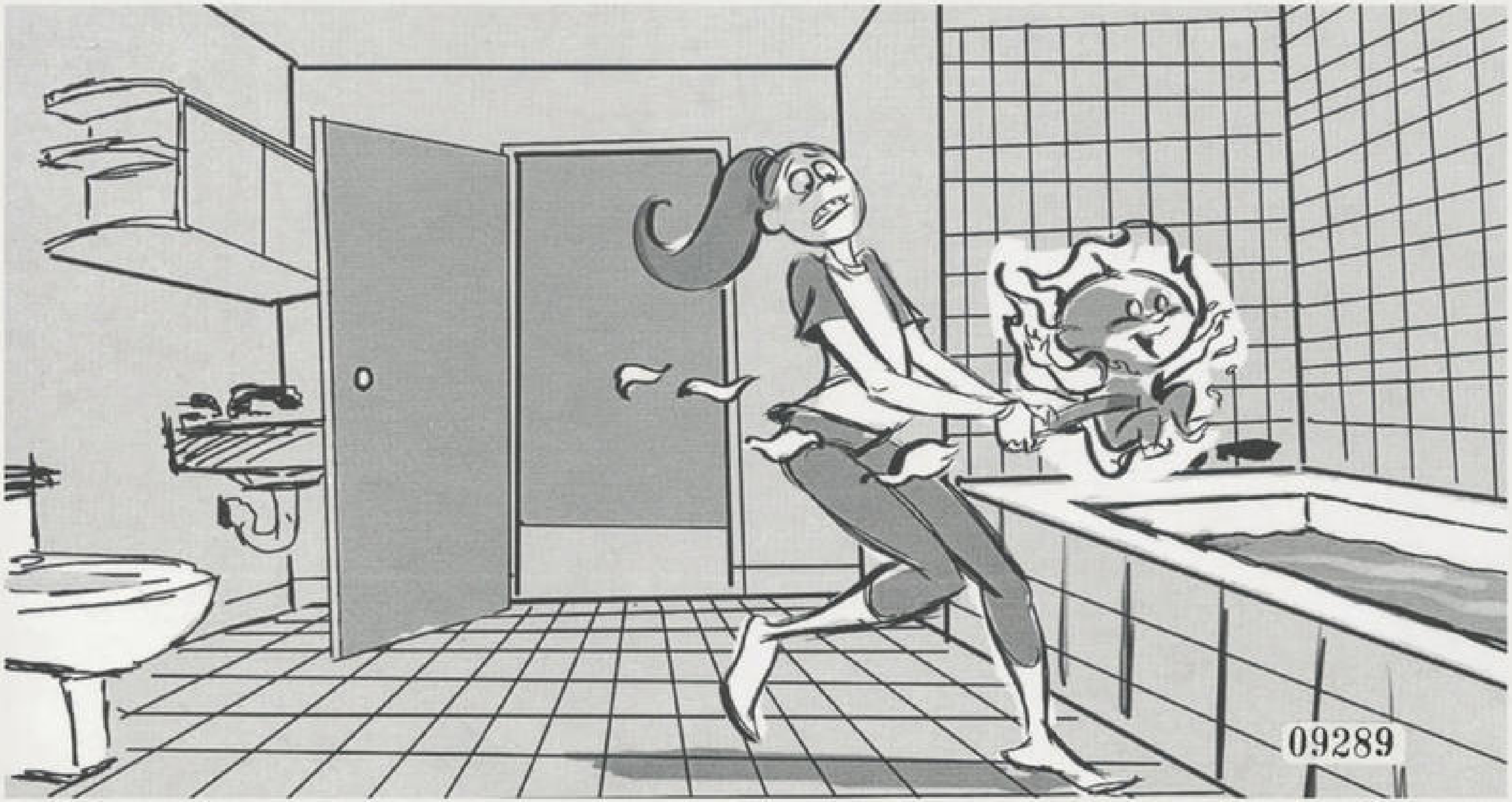


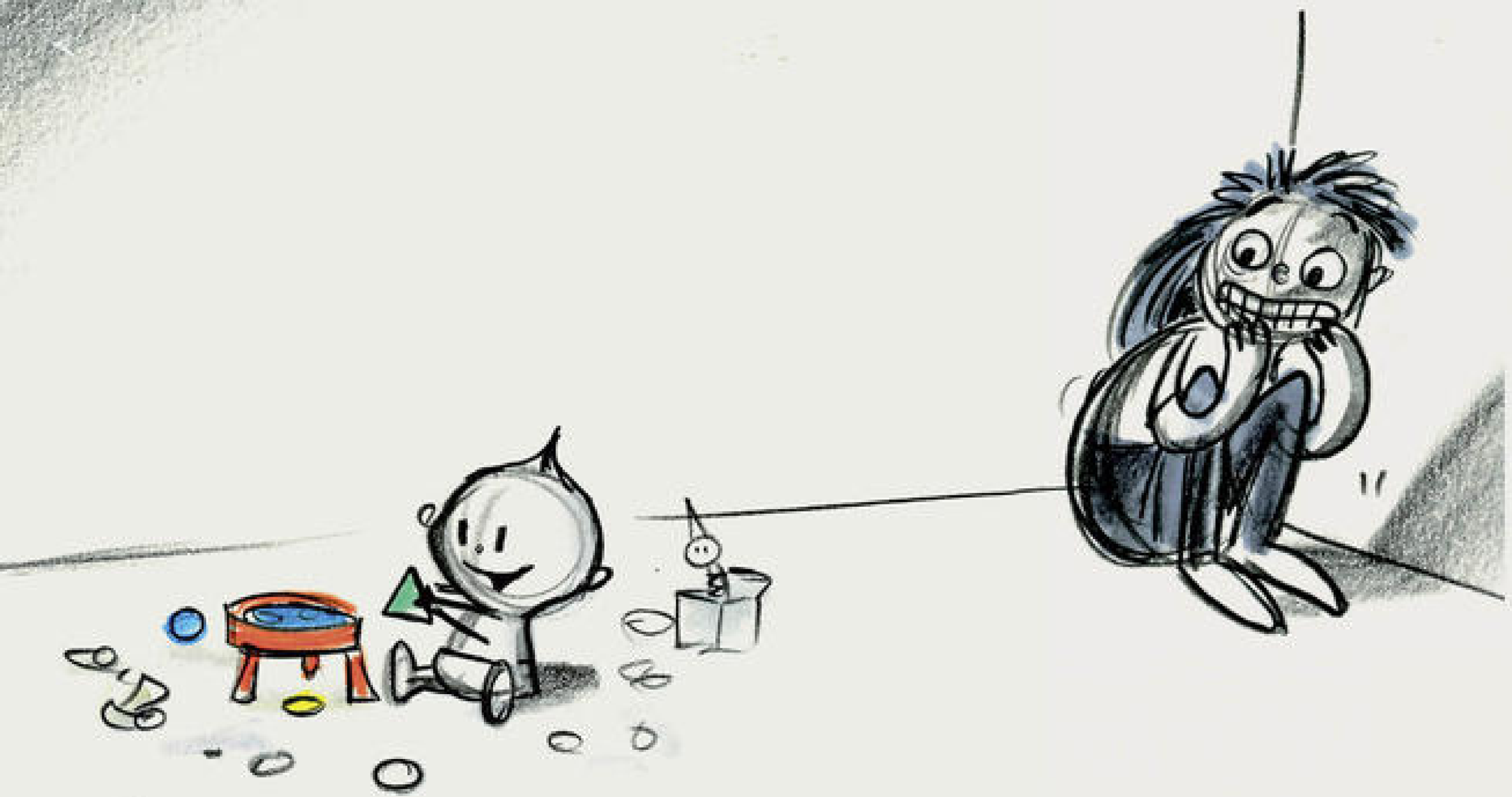


PAGE	
142, 143	**Title Design** (detail). Geefwee Boedoe. Mixed Media, 9" x 5¾", 2002
144	**Car Model Packet**, Gary Schultz, Pencil, 17" x 11", 2002
145	**Film Still**, 2002

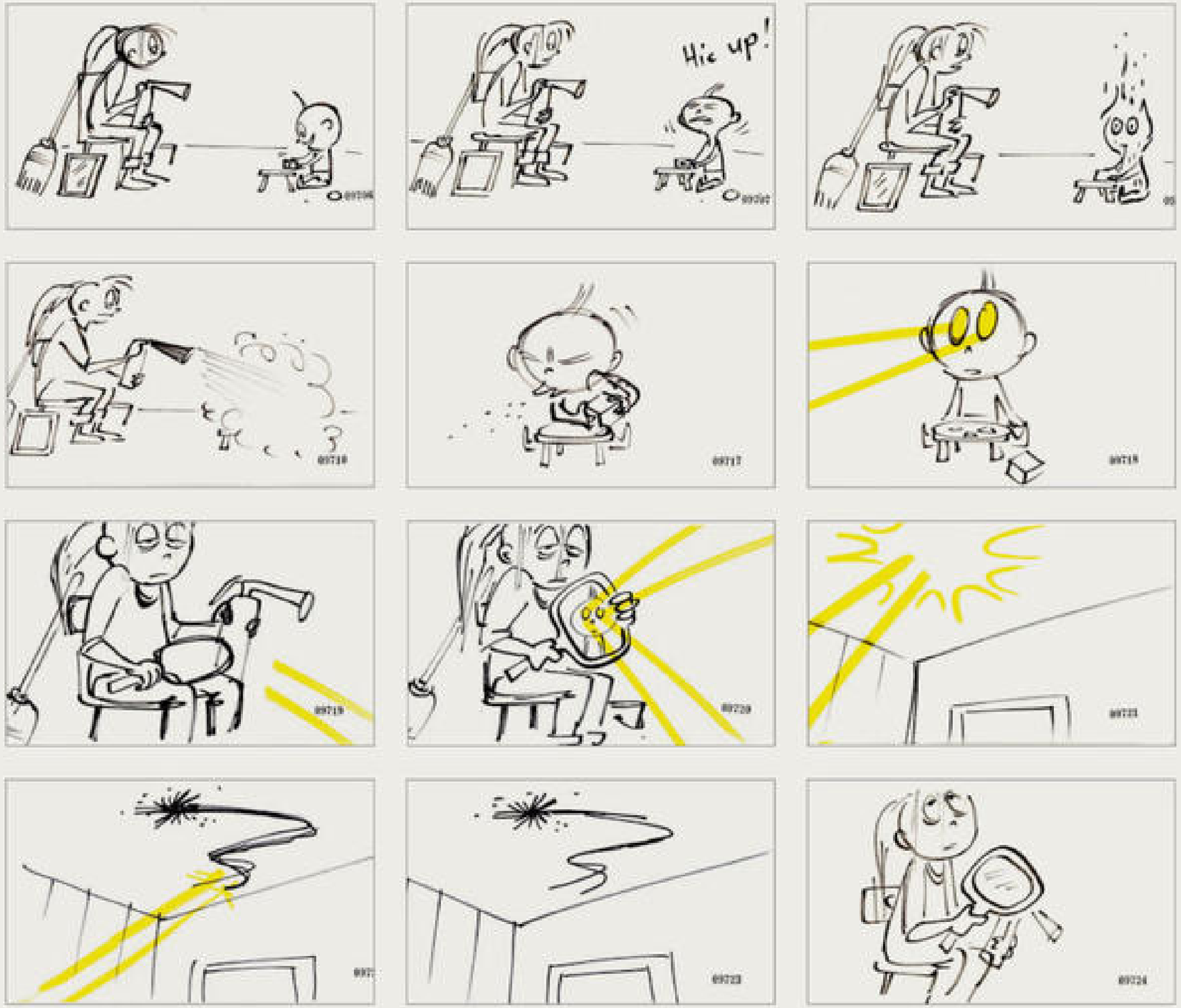
JACK-JACK ATTACK

RELEASE DATE	2005
RUNNING TIME	4 minutes 45 seconds
WRITER	Brad Bird
DIRECTOR	Brad Bird


09289

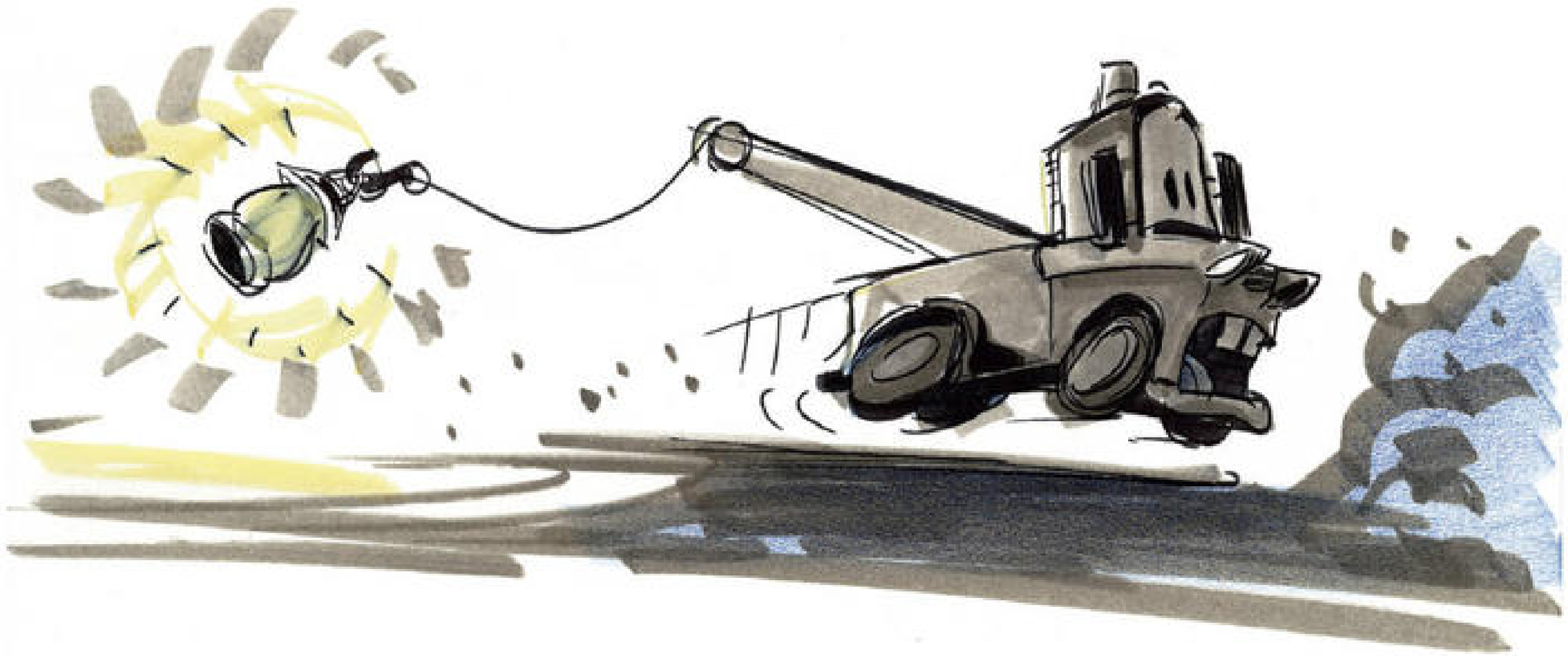


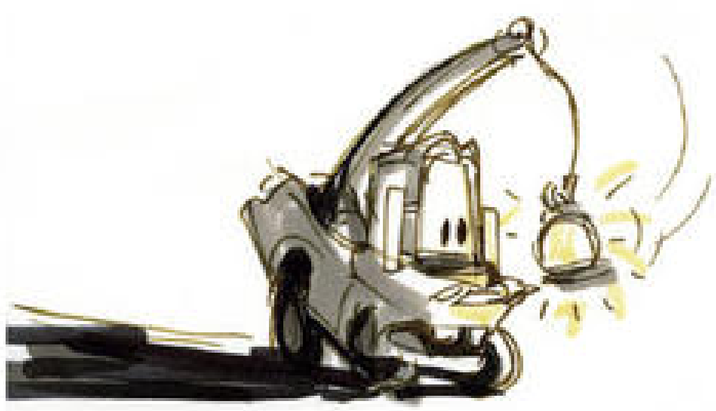
Left	**Color Script**, Lou Romano, Digital, 2004
Left	**Storyboards**, Mark Andrews, Digital, 2004
Left	**Storyboard**, Bobby Hamilton, Pencil and marker, 11" x 8"
Left	**Color Script**, Lou Romano, Digital, 2004

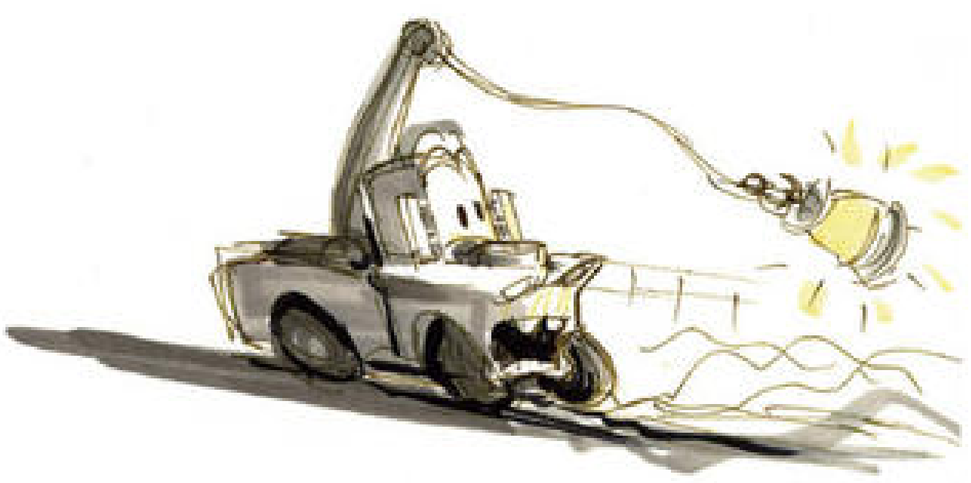


PAGE	
150	**Film Still,** 2005
151	**Storyboards,** Teddy Newton, Marker, Pencil, 9¼" x 5", 2005

MATER AND THE GHOSTLIGHT





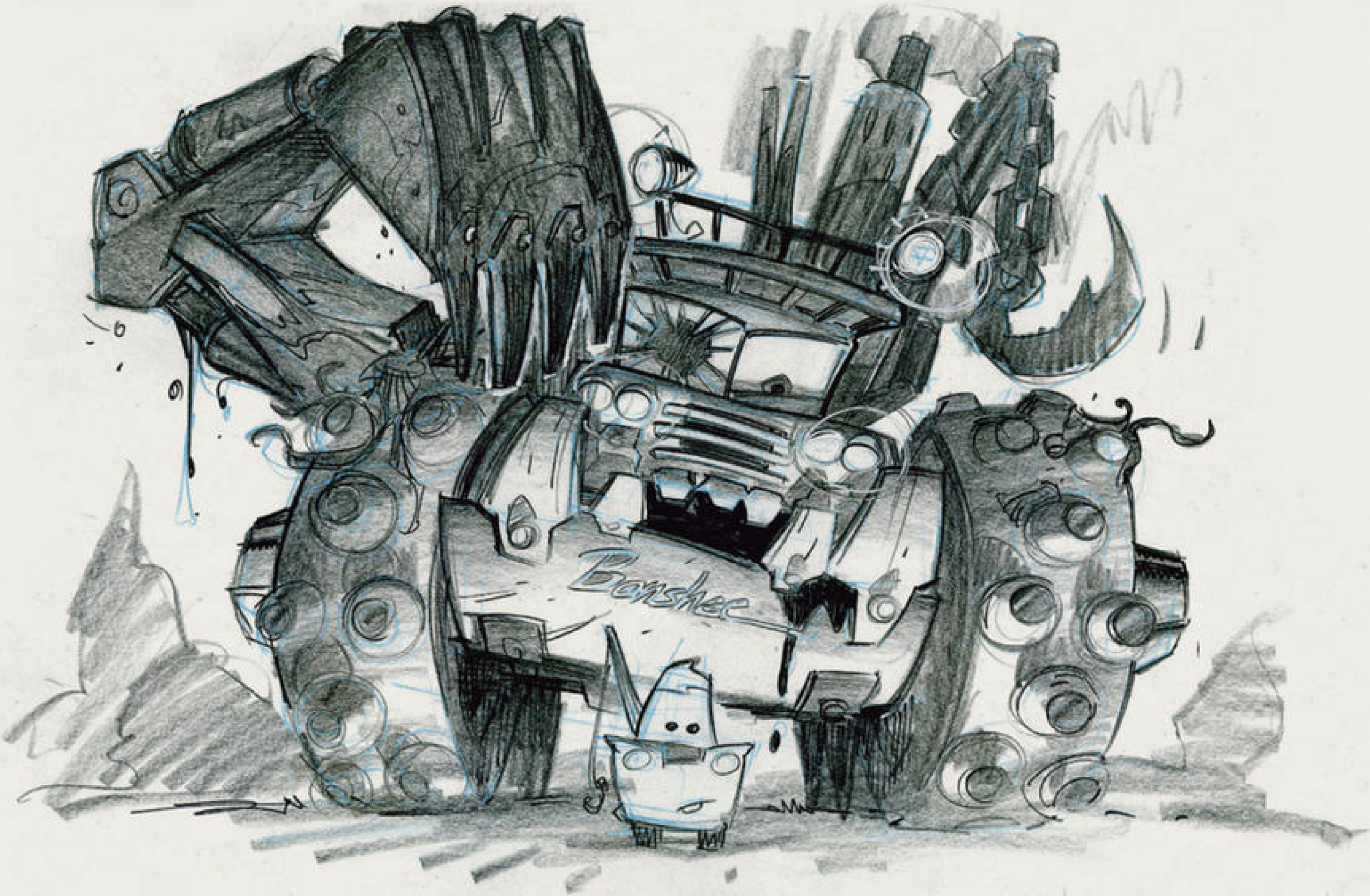


FIREFLY

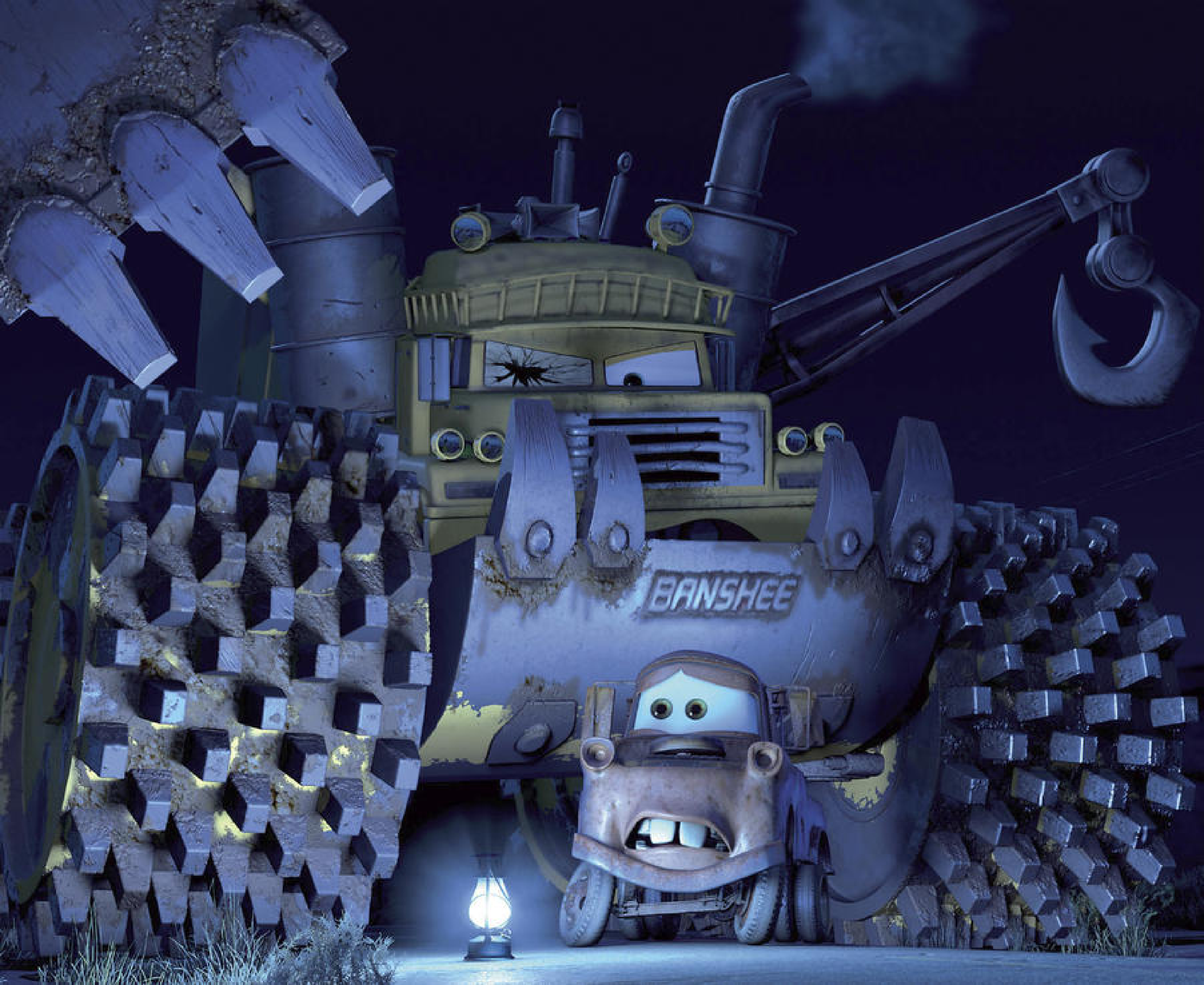
MATER'S GOOD HEADLIGHT FADES OUT.

NO NO NO...

AH BANG.



PAGE	
156	**Banshee Concept Art**, Steve Purcell, Pencil, Pen, 11" x 17", 2006
157	**Film Still**, 2006


BANSHEE

ACKNOWLEDGMENTS

Don't let the word 'short' in the title fool you. Even a book about animated shorts requires a long list of people to make reality, each of whom deserves my personal thanks. So thank you to all the directors who spent time talking with me about their work: John Lasseter, Alvy Ray Smith, Jan Pinkava, Pete Docter, Brad Bird, Ralph Eggleston, Bud Luckey, Andrew Jimenez, Mark Andrews, Gary Rydstrom, Dan Scanlon, and Roger Gould.

Thank you to the artists, technicians and studio personnel who spoke to me about their work: Steve Bloom, Ed Catmull, Bill Cone, Ronnie del Carmen, Ralph Guggenheim, Mark Holmes, Bryn Imagire, Tia Kratter, Teddy Newton, Eben Ostby, Bob Pauley, Bill Reeves, Lou Romano, and Doug Sweetland.

Thank you to my editor at Chronicle, Matt Robinson. Thank you Kat Chanover, Karen Paik, Peggy Tran-Le, and Aidan Cleeland at Pixar; Leigh Anna MacFadden at Disney Publishing; and Jennifer Kong, Sarah Malarkey, Molly Jones, Becca Cohen, Jacob Gardner, and Tera Killip at Chronicle. Thank you, Adam Abraham, for your editorial input, and to Public for your book design. And no small thanks to Celia Bullwinkel for every other kind of imaginable support throughout this project.

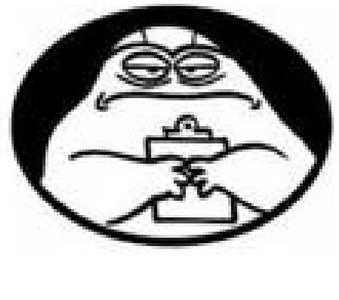
— Amid Amidi

PAGE

158 **Approval Stamps from Various Shorts,** mixed media

159 **Poster Graphics:** *One Man Band*, Jason Deamer (pencil), Randy Berrett (color), 2004

160 **Character Lineup**, *Lifted*, Jason Deamer, Pencil & Digital, 11" x 17", 2004



ABOUT THE AUTHOR

Amid Amidi is an animation historian and blogger who co-founded CartoonBrew.com, the animation-on-demand site CartoonBrewFilms.com, and the magazine and Web site Animation Blast. He is the author of Cartoon Modern, from Chronicle Books, and several other books about film. He lives in New York.

John Lasseter is the chief creative officer at Pixar and Walt Disney Animation Studios, and oversees all of Pixar's films and associated projects. A two-time Academy Award®-winning director, he directed the groundbreaking and critically acclaimed *Toy Story*, *A Bug's Life*, *Toy Story 2*, and *Cars*. Most recently, he executive produced *The Incredibles*, *Ratatouille*, and *WALL·E*.

At Pixar, every film is a labor of love—even the ones that are only five minutes long. *The Art of Pixar Short Films* reveals, in compelling text and colorful concept art, Pixar's strong legacy of short filmmaking and the creative process that nurtured the following show-stealers:

The Adventures of André & Wally B.	1984
Luxo Jr.	1986
Red's Dream	1987
Tin Toy	1988
Knick Knack	1989
Geri's Game	1998
For the Birds	2001
Mike's New Car	2002
Boundin'	2004
Jack-Jack Attack	2005
One Man Band	2006
Mater and the Ghostlight	2006
Lifted	2007

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